ARMY, MARINE CORPS, NAVY, AIR FORCE

TARGETING

THE JOINT TARGETING PROCESS AND PROCEDURES FOR TARGETING TIME-CRITICAL TARGETS

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AIR LAND SEA APPLICATION CENTER

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MULTISERVICE TACTICS, TECHNIQUES, AND PROCEDURES

FOREWORD

This publication has been prepared under our direction for use by our respective commands and other commands as appropriate.

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PREFACE

1. Scope

This publication describes the joint targeting process and provides tactics, techniques, and procedures (TTP) for targeting *surface* (land or sea) time-critical targets (TCTs). It describes specific procedures for joint force components in the coordination, deconfliction, and synchronization of rapid targeting and attacks in a joint environment. Though not prescriptive, this publication recommends procedures when multiple components have the capability to locate, identify, track, attack, and evaluate targets in overlapping areas of responsibility. The overall objective of this publication is to provide the joint force commander (JFC) and staff TTP to destroy surface TCTs and coordinate, deconflict, and synchronize the entire joint effort. By doing so, the JFC can minimize duplication of effort and the potential for fratricide while accomplishing the objective of rapid response.

2. Purpose

This publication has been prepared under the direction of the commander, US Army Training and Doctrine Command (TRADOC); commanding general, Marine Corps Combat Development Command (MCCDC); commander, Naval Doctrine Command (NDC); and commander, Air Combat Command (ACC). It sets forth multiservice TTP to guide the activities and performance of their commands when conducting joint, multinational, and interagency operations. It provides guidance for geographic combatant commanders, JFCs, and their staffs. It is not the intent of this publication to restrict the authority of the JFC. The JFC has full authority to organize the force and execute the mission in a manner deemed most appropriate to ensure unity of effort in the accomplishment of the overall mission. This publication augments and complements existing joint doctrine and joint TTP by providing additional operational warfighting procedures, guidance, and information. However, it is not intended for this publication to supplant any higher joint or combatant command directives.

3. Application

This publication provides JFCs and their operational staffs unclassified guidance for the joint targeting process and surface TCT targeting operations. Planners can use this publication to coordinate, deconflict, and synchronize targeting operations among components assigned to a joint force. Accordingly, this document serves as a cornerstone for planners to build and execute coordinated and integrated joint operations. Also, it will assist component training efforts when tasked to support multiple theaters. Finally, this publication provides a perspective on how other components define their service targeting process.

This publication is approved for use by the United States Army, Marine Corps, Navy, and Air Force.

4. Implementation Plan

Participating service command offices of primary responsibility (OPRs) will review this publication, validate the information, and reference and incorporate it in service manuals, regulations, and curricula as follows:

Army. The Army will incorporate the procedures in this publication in US Army training and doctrinal publications as directed by the commander, US Army Training and Doctrine Command. Distribution is in accordance with DA Form 12-11E.

Marine Corps. The Marine Corps will incorporate the procedures in this publication in US Marine Corps training and doctrinal publications as directed by the commanding general, US Marine Corps Combat Development Command. Distribution is in accordance with MCPDS.

Navy. The Navy will incorporate these procedures in US Navy training and doctrinal publications as directed by the commander, Naval Doctrine Command. Distribution is in accordance with MILSTRIP Desk Guide and NAVSOP Pub 409.

Air Force. Headquarters Air Force delegated approval authority for this publication to the commander, Air Combat Command. Air Force units will validate and incorporate appropriate procedures in accordance with applicable governing directives. Distribution is in accordance with AFI 37-160

5. User Information

a. The TRADOC-MCCDC-NDC-ACC Air Land Sea Application (ALSA) Center developed this publication with the joint participation of the approving service commands. ALSA will review and update this publication as necessary.

b. We encourage recommended changes for improving this publication. Key your comments to the specific page and paragraph and provide a rationale for each recommendation. Send comments and recommendation directly to—

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c. This publication reflects current joint and service doctrine, command and control organizations, facilities, personnel, responsibilities, and procedures. Changes in service protocol, appropriately reflected in joint and service publications, will likewise be incorporated in revisions to this document.

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TARGETING

The Joint Targeting Process and Procedures For Targeting Time-Critical Targets

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The Joint Targeting Process and Procedures for Targeting Time-Critical Targets

Overview

Joint force commanders (JFCs) require common joint targeting procedures to deconflict targeting operations, prevent duplication of effort, and reduce the potential for fratricide throughout the fluid, dynamic battlespace. This is especially true when joint force components have areas of operations that potentially overlap, as well as mutual interests and capabilities to strike targets of common interest. The JFC or component commander may designate these targets as time-critical, priority targets. Each component has the ability to view the battlespace with a multitude of surveillance and reconnaissance assets (organic, joint, and national). However, complicating this problem is the fact that components lack common targeting references for the battlespace. Few common targeting reference systems exist that ensure all targets possess discrete reference numbers universally recognized by all joint force components. One such system is the basic encyclopedia (BE) numbering system. Although this system is normally limited to fixed targets, BE numbering can be modified for mobile targets. Some theaters have used locally produced BE numbers for tracking such targets. However, there is no standardized joint procedure to do this. The National Military Target Intelligence Committee (MTIC) is working solutions to standardize such procedures and developing concepts for universal common target numbers (CTNs). But until those concepts are approved, the JFC has no common joint system for mobile targets. Instead, individual component numbering systems dominate the environment and are not translatable from one component to another. Further complicating this problem is the fact that although current component systems are robust and continue to grow rapidly, they are considerably "stovepiped" and not interoperable. Currently, the components cannot rapidly share common targeting information. Future systems (such as the Contingency Theater Automated Planning System [CTAPS] linked with the Advanced Field Artillery Tactical Data System [AFATDS]) could correlate individual component target numbers and communicate them simultaneously to all components. Those future systems, combined with joint force targeting procedures, will facilitate effective and efficient use of all attack assets.

Joint doctrine addresses the need for target coordination, deconfliction, and synchronization between components. Unfortunately, it does not adequately explain "how" to rapidly conduct this coordination. Likewise, joint tactics, techniques, and procedures (TTP) does not specifically outline joint targeting procedures. Instead, it defines overall concepts without delineating TTP. As a result, each combatant commander has developed procedures that are theater dependent targeting processes. As an example, the procedures governing Joint Targeting Coordination Boards (JTCBs) and guidance, apportionment, and targeting cells (GATs) vary from theater to theater. While this may work for forces permanently assigned to a combatant command, it requires nonassigned units to adapt considerably to theater specific procedures. Augmentees adapting to theater/CINC specific procedures will spend time adapting to theater unique coordination processes before executing time-critical missions.

Components must understand the joint targeting process to fulfill the JFC's intent and objectives. Effective coordination, deconfliction, and synchronization maximize force against the enemy while reducing the potential for fratricide. Components must have effective joint targeting procedures that ensure—

- Compliance with JFC guidance and objectives.
- Coordination, deconfliction, and synchronization of attacks.
- Rapid response to surface time-critical targets (TCTs).
- Prevention of fratricide.
- Minimal duplication of effort.
- Control of taskings for mutually accessible targets.
- Expeditious combat assessment.
- Common perspective of all targeting efforts.

Each component must understand the perspective and target priorities of other component targeting efforts throughout the campaign. Component targets may not necessarily be joint targets; therefore, coordination requirements may seem minimal. However, there may be situations where component organic weapons may be easily available, yet not the most capable. In such cases, coordination with other components may allow more efficient destruction of the target through the synchronized use of other available assets. In almost every situation, if component attacks affect the operations of another component, coordination, deconfliction, and synchronization must occur. The only exception would be those rare instances identified by the JFC where overriding concerns (such as theater ballistic missiles [TBMs] equipped with weapons of mass destruction) warrant bypassing normal coordination to affect immediate response. The JFC should make such exceptions only after balancing the threat with the potential for fratricide.

This publication explains the fundamentals of the joint targeting process and intelligence support to that process. It addresses the coordination, deconfliction, and synchronization of attacks against surface TCTs. The connection is that the joint targeting process serves as the foundation for the surface TCT targeting procedures.

The Joint Targeting Process

Joint targeting fundamentals are the functions, steps, and actions accomplished when conducting joint targeting operations. Joint targeting fundamentals include the definition of a target, explanation of what joint targeting is as a whole, and description of the joint targeting process. Joint Publication 1-02 succinctly describes a target as a *geographical area, complex, or installation planned for capture or destruction by military forces*. However, targets also include the wide array of mobile and stationary forces, equipment, capabilities, and functions that an enemy commander can use to conduct operations. Joint targeting is selecting targets and matching the appropriate response to them to meet a specified objective. The joint targeting process has six basic phases/functions: **commander's objectives and guidance, target development, weaponeering assessment, force application, execution planning/force execution, and combat assessment.**[1] Although commonly referred to as a "cycle," the joint targeting process is really a continuous process of overlapping functions independent of a particular sequence. Joint targeting significantly affects the theater campaign as the JFC must synchronize targeting efforts throughout the joint force to ensure the effective accomplishment of theater campaign objectives. Further complicating this is targeting occurs at all levels within a joint force by all forces capable of attacking targets. Therefore, it must be deconflicted, coordinated, and prioritized among components to ensure success.

Organizing for the joint targeting process is extremely dependent on the situation. JFCs may establish and task an organization within their staffs to accomplish broad targeting oversight functions or may delegate this responsibility to a subordinate commander.[2] The JFC may assign certain responsibilities associated with targeting to agencies on the staff. In addition, the JFC may appoint a JTCB. The JFC defines the role of the JTCB.[3] JTCB responsibilities and authority are defined by JFC directives and should ensure fulfillment of JFC objectives and intent with respect to targeting. Most importantly, the JFC should direct measures to coordinate joint targeting efforts among components. Regardless of how the JFC establishes procedures for joint targeting operations, the procedures must follow the basic principles of the joint targeting process and be flexible enough to respond to rapidly changing situations in the fast tempo of modern warfare.

Procedures For Targeting Time-Critical Targets

A surface TCT is a lucrative, fleeting, land, or sea target of such high priority to friendly forces that the JFC or component commander designates it as requiring immediate response. Surface TCTs require such immediate response because they pose, or will pose, a significant threat capable of inflicting casualties on friendly forces and civilians. Surface TCTs, left unserviced, could significantly delay achievement of the JFC's theater objectives. Surface TCTs can either be *planned* or *immediate*, requiring rapid response by the joint force. Targets of opportunity (TOOs) are similar to surface TCTs (that is, lucrative or fleeting), but they may or may not have been designated a high priority by the JFC or component commander. For example, an exposed, moving enemy command vehicle, spotted by a passing friendly aircraft, could be defined as a TOO. Although the opportunity to attack it is fleeting, it is not technically a surface TCT unless the JFC or component commander has designated enemy command vehicles as high priority targets. The distinction is a small but important one. The key is JFC/component commander designation as a priority. Otherwise, the joint force could not distinguish between TOOs and surface TCTs.

Procedures and techniques assist the joint force in the conduct of warfare, especially in regard to surface TCTs. Procedures dealing with surface TCTs include JFC guidance, joint battlespace control and coordination measures, "grid box" and "bullseye" techniques, and weapon specific procedures. Additionally, the JFC must structure command and control as well as interconnect battle management systems to ensure optimum conditions for successful operations against surface TCTs.

Summary

The primary goal of joint targeting is to provide the most efficient use of joint force assets and capitalize on their synergistic effects. Eliminating duplication of effort and fratricide is an important part of that efficiency. Likewise, eliminating the fog of war is critical to meeting the fratricide challenge while increasing a joint force's operational tempo. The JFC must ensure effective and efficient attacks against high priority surface TCTs, as well as exercise due caution to avoid fratricide and duplication of effort. Regardless of the threat, a joint force must be able to rapidly execute lethal and nonlethal attacks against surface TCTs using the synergistic power that components contribute, all the while considering that when components work together, they each have responsibilities (functional and/or area) that may intersect. Each must depend on and leverage the capabilities of the others to be decisive in battle. Application of these capabilities is enhanced through clear, concise joint targeting procedures allowing the JFC and components to rapidly coordinate information, deconflict operations, and synchronize attacks. Common target numbers, reference systems, and common pictures of the battlespace are developing technologies that will support joint targeting procedures in the future. This multiservice TTP offers a procedural fix until those capabilities fully evolve.

NOTES

[1] Jt Pub 3-56.1, *Command and Control for Joint Air Operations,* November 14, 1994, p IV-1

[2] Jt Pub 3-0, *Doctrine for Joint Operations,* February 1, 1995, p III-26

[3] Ibid

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Chapter I

THE JOINT TARGETING PROCESS

> ***"It is not the object of war to annihilate those who have given provocation for it, but to cause them to mend their ways."***
>
> **- Polybius**
> **Histories (2nd century B.C.)**

1. Background

a. **What is a Target?** A target is a geographical area, complex, or installation planned for capture or destruction by military forces.[1] Targets include the wide array of mobile and stationary forces, equipment, capabilities, and functions that an enemy commander can use to conduct operations at any level—strategic, operational, or tactical. Targets fall into two general categories, *planned* and *immediate* (Figure I-1).

(1) **Planned targets** are targets that are known to exist in an operational area and against which fire or attacks have been scheduled in advance or on-call. Examples range from targets on joint target lists (JTLs) in applicable campaign plans, to targets detected in sufficient time to list in the air tasking order (ATO) or fire support plans.

(2) **Immediate targets** are targets which fire or attacks have not been scheduled and normally detected too late to be included in the normal targeting cycle. Immediate targets have two subcategories: *unplanned* or *unanticipated*.

(a) **Unplanned immediate targets** are those which are *known* to exist in an operational area but not detected or located in sufficient time.

(b) **Unanticipated immediate targets** are those that are *unknown* or *unexpected* to exist in an operational area. Chapter II discusses planned and immediate targets in relation to surface time-critical targets (TCTs) and targets of opportunity (TOOs).

b. **What is Targeting?** Targeting is the process of selecting targets and matching the appropriate response to them taking into account operational requirements and capabilities.[2] Targeting occurs at all levels of command within a joint force and is performed at all levels by forces capable of delivering fires or attacking targets with both lethal and nonlethal disruptive and

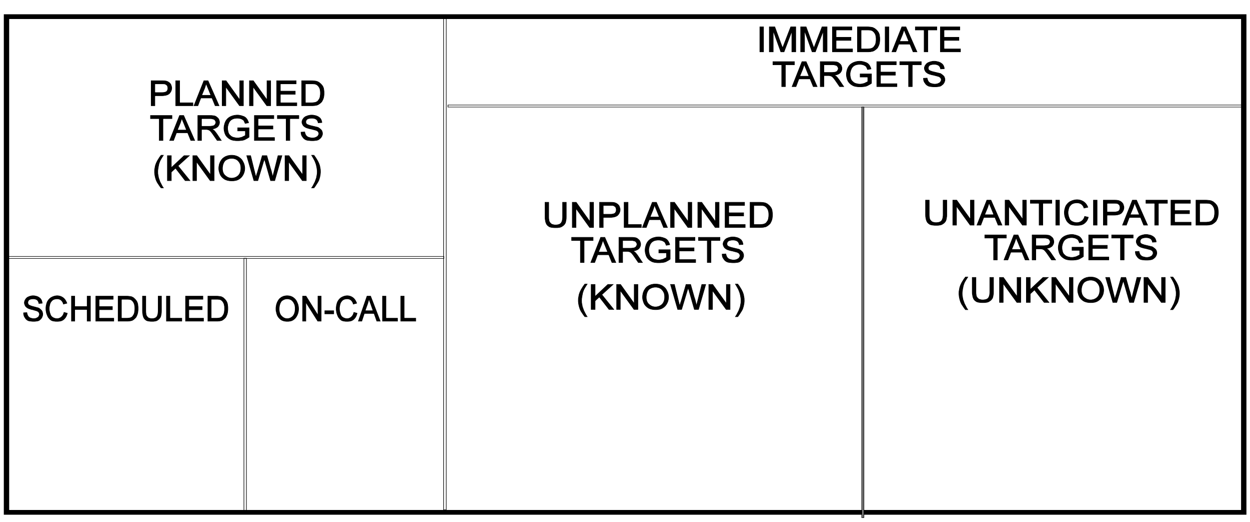

Figure I-1. General Target Categories and Subcategories

destructive means.[3] Targeting is a function shared by both operations and intelligence. However, the requirement to deconflict duplicative efforts of different echelons within the same force and to synchronize the attack of those targets with other components of the joint force complicates the targeting process. Therefore, an effective and efficient joint targeting process is essential for the JFC and components to plan and execute operations.

2. Joint Targeting Process

The joint targeting process determines the employment of military force to achieve a desired objective. It integrates capabilities of national assets, geographic combatant commands (that is, unified combatant commands), subordinate joint force, multinational, and component commands, all of which possess varying capabilities and requirements. The joint targeting process is described as a "cyclical process"[4] with sequential *phases*. However, the joint targeting process is really a continuously operating series of closely related, interacting, and interdependent *functions*. The six functions/phases are—**commander's objectives and guidance, target development, weaponeering assessment, force application, execution planning/force execution, and combat assessment (CA).** Joint targeting is not a static, inflexible process but rather a dynamic process that must be fluidly applied. Each function/phase of the process can directly affect other functions/phases of the process without regard to any specific order. For example, **CA** directly affects subsequent force application if mission results prove inadequate. Likewise, **weaponeering assessment** directly affects **execution** as weapons will drive execution tactics. In addition, specific timelines do not constrain the joint targeting process. Depending on the situation, the entire process can last from a few minutes (as in the case of a theater missile defense [TMD] scenario), to several days (such as in the development of an initial JTL for a CINC's campaign plan for a major operation), to several months (as in the development of the Single Integrated Operations Plan [SIOP]). Figure I-2 depicts the six basic functions of the joint targeting process that applies universally to each component of a joint force. Equally important to understand is that Army and Marine Corps service doctrine traditionally defines the targeting process as having four steps:

DECIDE—DETECT—DELIVER—ASSESS (D3A)

At first glance, when compared to the joint targeting process, the Army/Marine Corps service targeting process appears quite different. However, although labeled with different terms, the Army/Marine Corps service targeting process incorporates *the same fundamental functions as the joint targeting process* (Figure I-3). The functions of the Army/Marine Corps targeting process can be easily translated to the functions of the joint targeting process. Note that D3A functions flow fluidly across the six functions of the joint targeting process. ***(Note: In some cases, the functions of D3A may also overlap. For further information on D3A, see FM 6-20-10/MCRP 3-1.6.14, TTP for the Targeting Process.)*** Although components may not desire to eliminate or replace service unique doctrinal definitions for their targeting process, there must be a common joint targeting lexicon to eliminate confusion and provide a common perspective. D3A, once translated into the joint targeting process, supports this common lexicon and universally recognized "joint language."

a. **Commander's Objectives and Guidance**. Targeting responds to the objectives and guidance that originate at the national level as broad concepts. ***Objectives*** are the desired position or purpose. Starting at the national level as broadly defined statements, objectives become more specific and dynamic as commanders interpret and translate them into specific plans of action. ***Guidance*** provides the framework for employing forces to achieve the objectives. Joint force commanders (JFCs) refine national guidance and provide commander's intent; guidance; and clear, measurable, attainable objectives that become specific plans of action. JFCs establish broad planning objectives and guidance for attack of enemy strategic and operational centers of gravity and

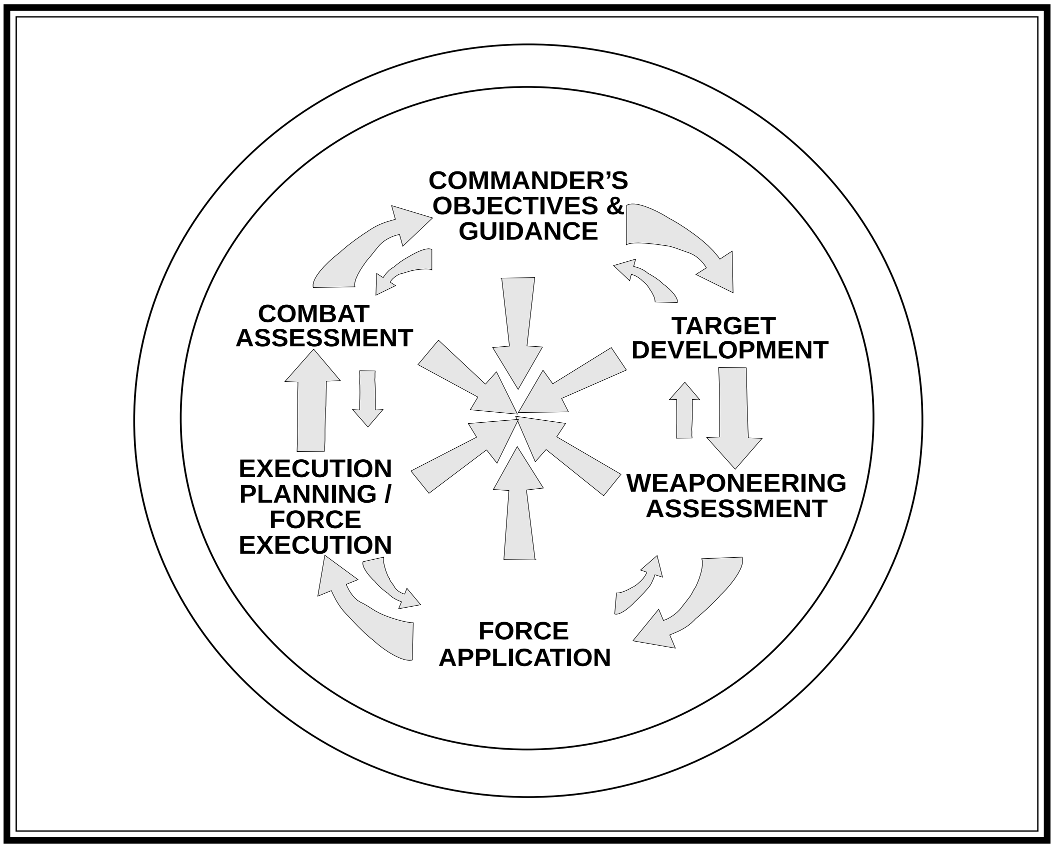

Figure I-2. The Joint Targeting Process

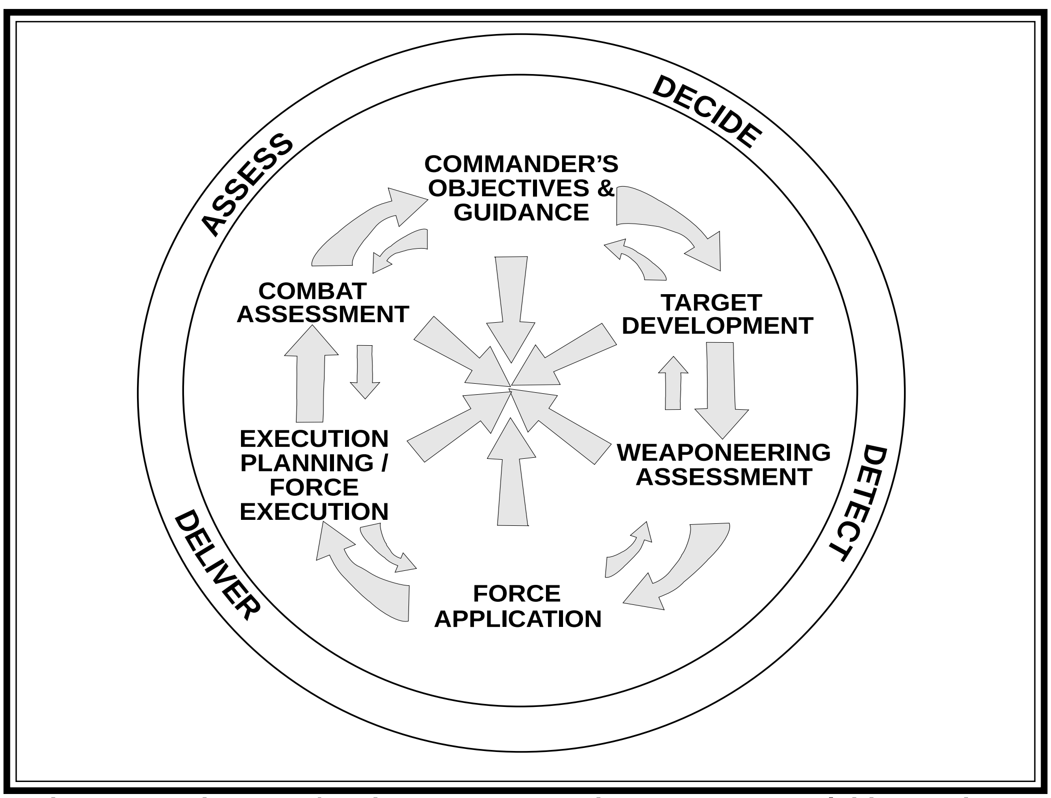

Figure I-3. The Army/Marine Corps Targeting Process Overlaid onto the Joint Targeting Process

interdiction of enemy forces as an integral part of joint campaigns and major operations.[5] Targeting matches objectives with inputs from intelligence, operations, and other functional areas (such as logistics and communications), to identify the forces available and necessary to accomplish the mission.

(1) The National Command Authorities (NCA) communicate national security objectives through the Chairman of the Joint Chiefs of Staff (CJCS) to the geographic combatant commander (unified CINC) as broad campaign objectives. The unified CINC translates the national guidance and provides clear, measurable, and attainable objectives to established JFCs and component commanders. **(*Note: In some cases, the unified CINC and JFC are one in the same. For the purpose of this publication, the term JFC will be used to represent the commander of any joint force.*)** Part of the objectives includes the articulation of damage levels and states desired for a specific period of operations. The more specific and measurable the objectives, the greater the likelihood joint force planning staffs and executing component forces will achieve an economy of force that will enable the most effective use of assets against the enemy. The objectives and guidance are shaped by the principles of war, the Laws of Armed Conflict (LOAC), and established rules of engagement (ROE).

(2) Intelligence preparation of the battlespace (IPB) provides the JFC a specific context to further specify objectives and guidance. IPB is a systematic, continuous process of analyzing the threat and environment in a specific geographic area. Included in the production of IPB is the detailed analysis of all available operational and intelligence information, to include the enemy situation, capabilities, strengths, composition, disposition, and locations. IPB also addresses possible courses of action, enemy perception of friendly vulnerabilities, and enemy operational sustainment capabilities.

(3) With the advice of the component commanders, the JFC sets priorities, provides targeting guidance, and determines the weight of effort for various operations. Subordinate commanders recommend to the JFC how to use their combat power most effectively to achieve the JFC's objectives. Weight of effort for any aspect of joint targeting may be expressed in terms of percentage of total available resources, priorities for resources used with respect to the other aspects of the theater campaign, or as otherwise determined by the JFC.[6]

(4) The JFC consults often with the component commanders to assess the results of the warfighting effort and to discuss the direction and future plans. This provides component commanders an opportunity to introduce recommendations, state support requirements, and provide their ability to support other components.

(5) The JFC's objectives and guidance identify targeting priorities, planning guidance, and procedures. For example, the JFC states guidance in the air apportionment decision. See Joint Publication 3-56.1, *Command and Control for Joint Air Operations*, for more information on air apportionment.

b. **Target Development**. This part of the process is the systematic evaluation of potential target systems, individual targets, and the elements of each target. Targets are systematically evaluated for military, economic, and political importance. Target development closely examines enemy doctrine and order of battle as well as takes into account operational concerns such as friendly schemes of maneuver, assets available, and battlespace geometry/ management. Identification of centers of gravity (COGs), such as key target systems and their critical nodes, is an essential part of this process. Personnel tasked to perform target development must identify and analyze key target systems relevant to the JFC's changing objectives and guidance. Target validation, target list prioritization, and collection also occur during this phase. Target development is an objective analysis conducted independently of munitions or platform availability.

(1) Target development has several steps:

(a) Establish information requirements

(b) Identify potential target systems

(c) Identify critical nodes and their activities and functions

(d) Develop target system models and utility measures

(e) Validate targets and "No-Hit" lists.

(f) Define production requirements

(2) Target development inputs are—

(a) Operation Plan Joint Target List (OPLAN JTL) Annex. For a given operational area, the OPLAN JTL Annex constitutes a target baseline. OPLAN JTLs are subsets of the military national intelligence integrated database/integrated database (MIIDS/IDB) modified to meet joint force requirements in various regions throughout the world. The OPLAN JTL is a "dynamic" database. During peacetime, the unified command J-2 modifies this database via inputs from both national agencies as well as assigned component forces.

(b) Battlespace Geometry Management. Assessment of battlespace geometry allows intelligence planners to accurately develop targets based on regional and geographic characteristics.

(c) All source national agency support.

(d) Enemy orders of battle (EOBs).

(e) Enemy military capability studies.

(f) Current intelligence assessments.

(g) Component target nominations.

(h) Joint Targeting Coordination Board (JTCB) inputs (if established).

(i) Existing basic encyclopedia (BE) numbered targets.

(3) Target development outputs are—

(a) JTL. In wartime, the OPLAN JTL Annex is updated and serves as an initial list of campaign targets. The JTL is the master target list that supports the JFC's objectives, guidance, intent, and courses of action. Also, it normally lists high-value targets (HVTs), which are later incorporated as high-payoff target (HPT) nominations during component wargaming.

• The JTL is normally constructed by the unified command with support from components and with inputs from the Joint Staff and other national agencies.[7] Component commanders will identify and select fixed and mobile targets that meet the JFC's objectives/guidance and submit them for inclusion in the JTL. Each component develops such targets to support its own assigned mission.

• The JTL is not a prioritized list of targets but contains prioritized target categories (command and control [C2], airfields, lines of communications, and others as appropriate) listing specific targets.[8] The JFC should prioritize the JTL target categories according to the campaign plan and focus the intelligence/target material production effort. Upon direction of the JFC, the JTL is updated daily or as required via target information report (TGTINFOREP) messages from components. Maintenance of the JTL may be conducted by the JFC's staff or as directed by the JFC (e.g., JTCB).[9]

(b) Joint Integrated Prioritized Target List (JIPTL). Joint doctrine allows the use of a JIPTL for prioritizing specific targets. ***(Note: In Combined Forces Command, Republic of Korea, this list is designated the single integrated prioritized target list [SIPTL].)*** The JIPTL is a JFC level product usually produced by the joint force air component commander (JFACC). Prioritization refers to a target's relative importance and significance within a specific target system and to other targets. Prioritization does not necessarily denote operational sequencing. See Joint Pub 2-01.1, *JTTP for Intelligence Support to Targeting,* and Joint Pub 3-56.1, *Command and Control for Joint Air Operations,* for additional information on the JIPTL.

(c) Inputs to intelligence collection plan.

(d) Restricted targets lists (targets not to be struck due to ROE, LOAC, or exploitation requirements).

(e) IPB event template.

(f) Established Target Selection Standards (TSS). TSS are criteria, applied to enemy activity (acquisitions and battlefield information), used in deciding whether the activity is a target. TSS break nominations into two categories: targets and suspected targets. Targets meet accuracy and timeliness requirements for attack. Suspected targets must be confirmed before any attack.

(g) Target Information. Generally, target information consists of—

• General location (area).

• Target type (category).

• Common target number (CTN), if available.

• Specific location.

• Disposition.

• Disposition size.

• Target velocity and direction.

• Surveyed target data.

• Target identification specifics.

• Unit identification.

(4) The J-2 supports target development with resources of the theater Joint Intelligence Center (JIC) at the geographic combatant command level, or the joint intelligence support element (JISE), at the subordinate joint task force (JTF) level. Component intelligence assets and intelligence organizations, along with augmentation from national intelligence agencies, also contribute. The theater JIC provides the coordination of intelligence resources, reporting, and services to support the tactical commanders.

c. **Weaponeering Assessment**. The purpose of the weaponeering assessment phase is to provide various force application options for each target based upon desired results. The process depends on detailed intelligence analysis of target construction and vulnerabilities combined with operational assessments of weapons effects and delivery parameters. Weaponeering assessment determines the quantity, type, and mix of lethal and nonlethal weapons required to produce a desired effect. It is an analysis of the best weapon combination for economy of force (that is, the best "bang for the buck"). Timeliness is also a critical factor in weaponeering decisions. The short dwell nature of TCTs requires the timely availability of an attack asset be an important factor in weapons selection.

(1) Using the JTL from the target development phase, intelligence planners conduct detailed analysis of target construction, system analysis, and interconnectivity with other systems to reveal key vulnerabilities. Intelligence planners also provide an analysis of threat

systems associated with each target to identify significant risks. Operational planners fuse the target and threat analysis with Joint Munitions Effectiveness Manual (JMEM) data and other nonlethal effects in order to assess expected results. If desired destruction criteria will be met, and other factors are favorable (such as weapons and delivery system availability), a variety of options with weapons recommendations are assigned to targets on the JTL. Recommendations prescribe the amount and type of ordnance as well as the number and type of delivery parameters to achieve desired effects.

(a) Lethal force weaponeering parameters include target vulnerability, weapons effects, aimpoint selection, delivery errors, weather, damage criteria, and weapon reliability.

(b) Nonlethal force weaponeering assessment is the assessment of the ability of friendly systems to observe activity, deceive, jam, affect (as in psychological operations [PSYOP]), disrupt, or deny access to critical friendly targets. Nonlethal weaponeering is a significant part of C2 attack analysis conducted by the joint force command and control warfare (C2W) cell. The C2W cell performs nonlethal targeting and weaponeering (effects and means) analysis to identify and match adversary C2 targets to friendly C2W and operational objectives.

(2) Weaponeering assessment is not a prediction of results but a statistical probability of weapons effects. It includes the detailed study and refinement of aimpoints, fuse delays, impact angles and velocities, weapons trajectories, number and type of weapons for employment (both air-to-surface and surface-to-surface), and recommended damage criteria. Depending on the assets of the component attacking the target, nature of the target, and time available to engage the target, weapons/munitions selection procedures can vary. In some cases very deliberate procedures can be used to weaponeer attack assets. In other cases, quick (often computer assisted) decisions must be made as to what attack assets will be employed. However, requisite assumptions in the prediction process may or may not match actual operational conditions, as variations in actual force employment may cause the results to vary greatly. This depends on the type of target, type of weapon, delivery system, weather, threat, and range to the target. The result in weaponeering assessment is a probability of damage against the designated target and the recommended weapons or weapon systems required to achieve the required level of damage.

d. **Force Application**. Force application is the selection of lethal or nonlethal forces for the mission. It integrates previous phases in the cycle and fuses weaponeering assessment with available forces. Force application is primarily an operations function, but it requires considerable intelligence support. Intelligence and operations staffs work closely to optimize the force necessary to achieve the objective considering operational realities and data (available assets). With guidance from the JFC, component commanders conduct force application planning to fuse target, weapon system, munitions, and nonlethal force options. This phase results in the jointly coordinated selection of forces and associated weapon systems or platforms.

(1) The primary objectives of force application are to sequence target attacks and synchronize the application of lethal or nonlethal force.

(2) During force application, the components identify primary resources to execute missions and supporting requirements. To accomplish force packaging and task organization, the planners must have a concise list of assets to include various component resources available for JTL targets. During this process, force packaging and task organization may group various targets based on geographic location to

facilitate economy of force and unity of effort. Likewise, a relatively high priority target may go unserviced because of situational factors that render the target too force-intensive to execute.

(3) Intelligence provides planners updated threat analysis for intended targets. This includes air and ground threats en route to targets. Intelligence estimates of the threat must reveal situational factors indicating whether or not the threat is too high for successful mission accomplishment. If so, the target may require reevaluation for either a different weapon system to attack it; a different target in the target system; or postponement of the attack until the threat is diminished. In either case, an accurate intelligence assessment of the current threat is a critical aspect of the force application process.

(4) The key products from the force application phase are the master air attack plan/ATO shell for the air effort or an attack guidance matrix (AGM) for the ground effort.

e. **Execution Planning/Force Execution**. The JFC will issue mission type orders directing component commanders to execute the operation.

(1) Execution Planning. Component commanders and their staffs, upon receipt of the execution order from the JFC, conduct mission planning and preparation for engagement. The ATO and AGM guide respective components in the preparation of schedules, missions, route planning, and tactics to execute attacks. Due to inevitable changes in the enemy situation (thereby the assumptions used in the force application phase), intelligence and operations personnel need to analyze the ATO and AGM to validate whether or not they accurately address the current enemy situation. This analysis and validation are an ongoing function throughout execution planning, as IPB is a continuous process. IPB can significantly enhance the targeting process for surface TCTs by identifying the probable locations or operating areas where surface TCTs may emerge. Depending on the seriousness of the threat, resources available, and level of confidence in the IPB, component commanders may elect to position or posture target acquisition and strike assets to rapidly respond to the forecasted areas. During execution planning, intelligence also closely monitors target status in order to update final planning before execution. It must identify changes required to current taskings, as well as provide changes to follow-on target development phases and weaponeering phases. Inputs from intelligence planners update enemy threat assessments and directly impact a broad area, such as tasking orders, operations orders (OPORDs) and associated annexes, deconfliction plans, decision support templates (DSTs), schedules of fires, and support OPORDs. Intelligence planners also play a major role in mission planning support. This includes threat locations, target materials, graphics, maps, charts, geodesy products, and surveyed data points.

(2) Force Execution. As directed, components and their assigned forces execute their operations while monitoring other components. Components report laterally to each other and vertically to the JFC. Component commanders monitor the execution phase and provide real-time recommendations for redirection of forces, reattack, and other taskings as the situation warrants. Intelligence must also monitor the execution of the plan and be prepared to provide immediate threat and target updates should a change in the plan occur. Mission execution requires the flexibility to impact unforeseen surface TCTs. The intelligence architecture and collection plan must rapidly address these types of threats.

f. **Combat Assessment.** CA directly affects all other phases of the joint targeting cycle. CA is the determination of the overall effectiveness of force employment during military operations.[10] At the JFC level, the CA effort should be a joint program, supported at all levels, designed to determine if the required effects on the adversary envisioned in the campaign plan are being achieved by the joint force components to meet the JFC's overall concept.[11]

(1) CA seeks to determine if the JFC's objectives for an operation are being or have been met and provides information that helps determine if they need to be modified. Three questions make this determination: Were the strategic operational and tactical objectives met by force employment? Did the forces employed perform as expected? If the above answers are no, what will fix the problem? CA provides the JFC information on past performance so operations can decide how to apply future planning.

(2) CA is accomplished at all levels in the joint force. JFCs should establish a dynamic system to support CA for all components. Normally, the joint force J-3 will be responsible for coordinating CA, assisted by the joint force J-2.[12] Also, the JTCB (if established) should receive CA information in order to fulfill their assigned responsibilities.

(3) Intelligence supports CA by providing objective assessments on the overall impact of military operations against adversary forces, possible enemy courses of action (COAs), and predictions of enemy intent. These assessments come from a variety of sources, to include mission reports (MISREPs), aircraft in-flight reports (INFLTREPs), reconnaissance reports, intelligence summaries (INTSUMs), national systems, and reports from joint reconnaissance, surveillance, and target acquisition (RSTA) systems.

(4) CA includes battle damage assessment (BDA), munitions effect assessment (MEA), and reattack recommendation (RR). **(*Note: Some services also include the evolving concept of mission assessment [MA] as part of the CA phase.*)**

(a) BDA. BDA is a principal subordinate element of CA. BDA attempts to determine the impact of operations against individual targets and target systems. BDA is the estimate of physical, functional, and target system damage resulting from the application of military force, either lethal or nonlethal, against a predetermined objective. Although primarily an intelligence responsibility, accurate BDA depends on the coordination and integration between operations and intelligence. BDA uses all source intelligence to assess target damage and response. During each phase of the BDA process, determinations are made on what adjustments, if any, are required in other phases of the joint targeting process.

• Phase I BDA-Initial. Phase I BDA is an initial analysis, based primarily on visual observation of the target and usually derived from a single source. Inputs come from aircrew MISREPs and debriefs, weapon systems video, manned and unmanned imagery reconnaissance, and other sources. The unit controlling the weapon system develops Phase I BDA. Reports should state whether a target was hit or missed and include an initial estimate of damage. Phase I is usually the first indicator of problems with weapon systems or tactics assessed during MEA.

• Phase II BDA - Supplemental. Phase II BDA reviews all phase I damage assessments and amplifies the initial analysis. Phase II draws on all source intelligence and operational data to determine functional damage to a target and an estimate of impact on the target system. This phase requires the integration of theater and national source information. The theater JIC has access to these sources and provides significant support. Signals intelligence (SIGINT), imagery intelligence (IMINT), and measurement and signature intelligence (MASINT) sources are useful during this phase.

• Phase III BDA - Target System Assessment. Primarily performed in large-scale operations, Phase III BDA produces a target system assessment by fusing all supplemental BDA with the experience of subject matter experts. It provides the JFC with an estimate of the remaining capabilities of the targeted system. Its fundamental use is an input for determining if objectives are being met. The fundamental determination made during phase III BDA is how successful efforts have been to degrade or deprive the enemy's warfighting capability. The bottom line question is—*How successful have our efforts been to degrade or deprive the enemy's warfighting capability?*

(b) MEA. MEA provides feedback on how well ordnance, tactics, weapon systems, and platforms performed in combat. MEA is primarily an operations responsibility requiring inputs from the intelligence community. MEA is conducted concurrently and interactively with BDA to evaluate ordnance, weapon system, and tactics performance and continues over an extended period of time beyond the BDA process. MEA evaluates weapons parameters such as delivery accuracy, fusing, and damage mechanisms (blast, fragmentation, and penetration). In the MEA process, analysts identify weapons and tactics/munitions deficiencies. Once a deficiency is identified, the analysts make recommendations either for procedural changes, different tactics, or system modifications.

(c) RR. RR is a combined operations and intelligence function. It provides the JFC specific advice on reattack of targets and further target selection to achieve objectives. RR develops recommendations on which targets may require reattack, based upon the enemy's remaining capability, capacity, and potential for recuperation. In doing so, it also attempts to solve deficiencies identified during the BDA and MEA processes. Reassessment of objectives, target selection, vulnerabilities, timing, tactics, weapons, and munitions factors into the new recommendations. Reattack recommendations are passed back into the joint targeting cycle at the target development, force application, and execution planning/force execution phases. In addition, RR provides significant indications for the further exploitation of the ongoing operations, thus "restarting" the targeting process with the development and definitions of new objectives.

(d) MA. Though not a formally recognized part of CA, some services are beginning to use the evolving concept of MA to address the effectiveness of the overall operation in light of commander's objectives and guidance. MA gives the JFC a broad perspective of the comprehensive impact of operations against the enemy and evaluates mission accomplishment on the enemy's warfighting and war sustaining capabilities.

3. Organizing for the Joint Targeting Process

The JFC conducts the joint targeting process within an established organizational framework optimized for targeting operations. A primary consideration in organizing this framework is the joint force's ability to coordinate, deconflict, and synchronize joint targeting operations. The structure established by the JFC must facilitate the joint targeting process throughout the entire spectrum of anticipated targeting timelines. It must conduct effective joint targeting for long-term, daily, and rapidly changing time-critical situations. The JFC defines this structure based upon assigned, attached, supporting forces; threat; mission; and operational area. The structure must focus on enemy COGs to expedite campaign success. It must also identify those critical vulnerabilities that directly or indirectly lead to the degradation of enemy COGs. Also, it must be responsive enough to react to rapidly changing events. A targeting structure that quickly coordinates and synchronizes joint targeting operations will effectively counter high priority, time-critical threats. Likewise, it should execute all phases of the joint targeting process efficiently and continuously.

a. **Intelligence Division (J-2)**. The J-2 oversees the intelligence operations of the joint force and provides intelligence to all levels of the command for planning, directing, and conducting operations. The J-2 is the staff agency with the primary responsibility for prioritization of intelligence collection efforts, target detection, validation, and BDA for all operations. Also, the J-2 is a major participant in the detection of targets and the target prioritization process.

b. **Theater JIC**. The theater JIC is located at combatant command level and integrates all national and DOD supporting capabilities to develop a current intelligence picture. The National Military Joint Intelligence Center (NMJIC) supports their efforts. The theater JIC is the center of intelligence activities supporting the JFC, J-2, and components and provides the all-source analysis and target materials to support the targeting and BDA process. At the subunified command and JTF level, a JISE assists in coordinating JIC operations.

c. **Operations Division (J-3)**. The J-3 assists the commander in the discharge responsibility of the direction and control of operations, beginning with the planning and follow-through until specific operations are completed. In this capacity, the J-3 plans, coordinates, and integrates operations. The flexibility and range of modern forces require close coordination and integration for effective unity of effort. When the joint staff includes a Plans Division (J-5), it also performs the long range or future planning responsibilities.[13]

d. **Joint Targeting Coordination Board**. JFCs may establish and task an organization within their staffs to accomplish broad targeting oversight functions or may delegate the responsibility to a subordinate commander. Typically, JFCs organize JTCBs. If the JFC designates, a JTCB may be an integrating center for this effort or a JFC-level review mechanism. In either case, it needs to be a joint activity composed of representatives from the staff, all components, and, if required, their subordinate units. JFCs task commanders or staff officers with the JTCB function based on the JFC's concept of operations and the individual's experience, expertise, and situational awareness appropriate to the situation. The JFC defines the role of the JTCB. Typically, the JTCB reviews targeting information, develops targeting guidance and priorities, and may prepare and refine JTLs. The JTCB should also maintain a complete list of restricted targets and areas where special operations forces (SOF) are operating to avoid endangering current or future operations.[14]

(1) The JTCB maintains a macro-level view of the area of responsibility (AOR)/joint operations area (JOA) and ensures targeting nominations are consistent with the JFC's campaign plan.[15] This view encompasses *all* component operations and *all* joint force targeting (not solely air targeting). Its principal focus is on the strategic and operational level of war.

(2) The JTCB must maintain a campaign-level perspective and should not involve itself at levels of detail best left to the component commanders, such as selecting specific targets and aimpoints, or development of attack packages.[16] They do not write master air attack plans, develop ATOs, develop AGMs, or make apportionment decisions. Components are responsible for planning and execution.

(3) The JTCB generally focuses on operations beyond a 24-hour cycle. It may have difficulty monitoring operations short of a 24-hour period and may have little or no ability to affect real-time targeting operations. Other solutions, such as component to component direct coordination, must occur to fulfill the role of rapid deconfliction, synchronization, and coordination.

(4) The JTCB as a planning support function helps components follow the JFC's intent in the execution of operations by preparing targeting guidance, refining joint target lists, and reviewing target information.[17]

(5) The JFC may direct the JTCB to maintain the JTL.[18]

(6) The JTCB may serve as a focal point to coordinate joint force/component targeting operations with other operations, such as logistics and space/national asset support.

(7) In multinational operations, the JTCB may be subordinate to a Multinational Targeting Coordination Board, with JFCs or their agents representing the joint force on the multinational board.[19]

e. **Component Commanders**. Component commanders are instrumental in the execution of targets resulting from the joint targeting process and identifying targets critical to their operations. They are instrumental in assisting the JFC in formulating guidance, controlling many of the collection assets, executing operations against targets, and providing feedback as part of combat assessment. These functions remain constant regardless of joint force organization (functional or service). Coordination and communication between components are especially critical in regard to TCTs. JFCs establish common procedures, communications, and target reference systems to enable them to quickly react when a TCT presents itself. Joint Pub 3-0, *Doctrine for Joint Operations*, provides further information on component commander targeting responsibilities. Joint Pub 3-56.1, *Command and Control for Joint Air Operations*, explains JFACC targeting responsibilities. Joint Pub 3-05.5, *Special Operations Targeting/Mission Planning Responsibilities*, explains joint special operations task force (JSOTF) targeting responsibilities.

f. **Delegation Of Targeting**. JFCs will normally delegate the authority to conduct execution planning, coordination, and deconfliction associated with targeting and will ensure that this process is also a joint effort involving applicable subordinate commands. Whoever is designated this responsibility must possess or have access to a sufficient C2 infrastructure, adequate facilities, and ready availability of joint planning expertise. Should such an agency be charged with joint functional command responsibilities, a joint targeting mechanism is also needed to facilitate this process at this level. All components are normally involved in targeting and should establish procedures and mechanisms to manage the targeting function.[20]

NOTES

[1] Jt Pub 1-02, *DOD Dictionary of Military and Associated Terms,* March 23, 1994, p 364

[2] Jt Pub 3-0, *Doctrine for Joint Operations,* February 1, 1995, p III-25

[3] Ibid

[4] Ibid, p III-26

[5] Ibid, p III-25

[6] Ibid, p III-26

[7] Jt Pub 3-56.1, *Command and Control for Joint Air Operations,* November 14, 1994, p IV-8

[8] Ibid

[9] Ibid

[10] Jt Pub 3-0, *Doctrine for Joint Operations,* February 1, 1995, p IV-16

[11] Ibid

[12] Ibid

[13] Jt Pub 0-2, *Unified Action Armed Forces (UNAAF),* February 24, 1995, p IV-20

[14] Jt Pub 3-0, *Doctrine for Joint Operations,* February 1, 1995, p III-26

[15] Jt Pub 3-56.1, *Command and Control for Joint Air Operations,* November 14, 1994, p IV-2

[16] CSAF/CSA Article, *The Army-Air Force Team: Leveraging Our Strengths,* p 5

[17] Ibid

[18] Jt Pub 3-56.1, *Command and Control for Joint Air Operations,* November 14, 1994, p IV-8

[19] Jt Pub 3-0, *Doctrine for Joint Operations,* February 1, 1995, p III-26

[20] Ibid, pp III-26 and III-27

Chapter II

PROCEDURES FOR TARGETING TIME-CRITICAL TARGETS

"When you see a rattlesnake poised to strike, you do not wait until he has struck before you crush him."

-Franklin D. Roosevelt
11 September 1941

1. Surface Time-Critical Targets

A TCT is a lucrative, fleeting, air, land, or sea target of such high priority to friendly forces that the JFC/component commander designates it as requiring immediate response. TCTs pose, or will pose, an imminent threat to friendly forces or present an exceptional operational or tactical opportunity. Other adjectives commonly used to describe a TCT are *emerging, perishable, high payoff, short dwell, or time-sensitive* (as defined in Joint Pub 1-02, *DOD Dictionary of Military and Associated Terms*). This chapter deals exclusively with *surface* (land or sea) TCTs. Most surface TCTs typically move rapidly and hide throughout the battlefield, limiting their exposure time. In terms of the joint targeting process, the JFC/component commander sets surface TCTs as priorities during the commander's objectives and guidance phase. Target development dedicates sensors for detection and identification, and weaponeering assessment provides the JFC options for attack. Force application assigns attack assets, after which the execution planning/force execution phase employs force. CA follows through with feedback for subsequent engagements.

a. Examples of surface TCTs include mobile rocket launchers (MRLs), mobile high threat surface-to-air missiles (SAMs), theater ballistic missiles (TBMs), supporting launchers, mobile weapons of mass destruction (WMD), or mobile C2 vehicles and facilities.

b. Surface TCTs may also be fixed targets, such as operational-level command centers that, once their location is determined, must be destroyed quickly to allow further friendly force actions. Other fixed-surface TCTs may be nuclear or chemical weapons depots, (when transportation of the stored weapons is imminent, or if hidden, once they are detected), or fixed surface-to-surface missile (SSM) sites (when detected and threatening to launch). Under certain circumstances, ordinary fixed-surface targets may be classified as time-critical if they present a lucrative opportunity that the JFC/component commander determines is a priority. For example, an enemy airfield may become a surface TCT if it is determined (through intelligence sources) it will soon support aircraft equipped with WMD. Likewise, a bridge, previously left standing to channel enemy movement, may become a surface TCT once the commander determines it is time to destroy it and seal off an avenue of escape.

c. Surface TCTs are classified as either **planned** or **immediate** (Figure II-1).

(1) **Planned** surface TCTs are ordinarily fixed targets, known to exist in an operational area, that have been upgraded to time-critical status due to JFC/component commander priority. This is normally due to a newly acquired "short dwell" status that presents an exceptional operational or tactical opportunity. Fires and attacks are placed on-call against planned surface TCTs. Generally, surface TCTs (as planned targets) are limited in number.

(2) **Immediate** surface TCTs are mobile TCTs against which fire or attacks have not been scheduled. Some fixed TCTs may also be immediate. Immediate surface TCTs have two subcategories—unplanned and unanticipated.

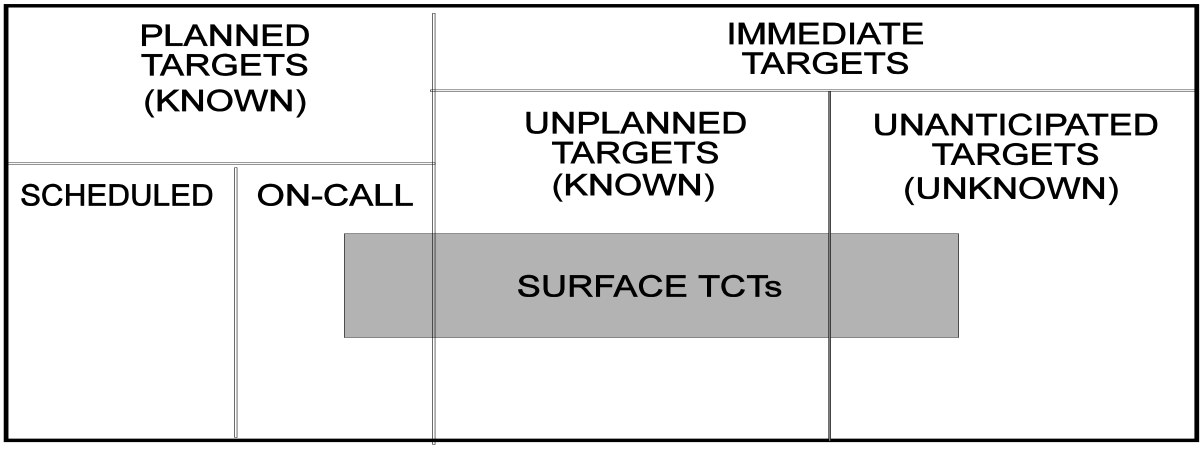

Figure II-1. Surface TCT Relationship to Planned and Immediate Targets

(a) **Unplanned immediate surface TCTs** are those *known* to exist in operational areas but have no fire or attacks scheduled. They are generally the largest category of surface TCTs. They require established procedures for proactive, timely acquisition by sensors and immediate response once acquired. The JFC directs component commanders to assign adequate attack assets to respond to all unplanned immediate surface TCTs in an operational area. In situations where a JFC or component commander does not have sufficient attack assets, prioritization must occur.

(b) **Unanticipated immediate surface TCTs** are those surface TCTs not expected or *unknown* to exist in an operational area. This category of surface TCT is the most dangerous as response is extremely reactive due to the element of surprise. Established procedures for proactive, timely acquisition and immediate response are still required. JFC/component commanders can minimize this element of surprise by ensuring procedures are flexible to responses against this type of target, regardless of target location or type.

2. Target of Opportunity

A TOO is a target visible to a surface, airborne, or space based sensor or observer, within range of available weapons, and against which fire or attacks have not been scheduled or requested.[1] It is either an **unplanned** or **unanticipated** target that may not be a danger to friendly forces. Also, it may present a narrow window of opportunity for attack due to limited time of exposure. A TOO may have the same lucrative, fleeting characteristics as a surface TCT. However, the key discriminator between a TOO and a surface TCT is JFC/component commander priority and dwell time. For example, if a sensor acquires a "short-dwell" command vehicle against which no fires or attacks have been scheduled or requested (that is, "on-call"), the command vehicle is a TOO. If the JFC/component commander has *not* designated such command vehicles as high priorities requiring immediate response, it is *not* considered a surface TCT. However, if the sensor acquires such a command vehicle under the same conditions (no scheduled or requested/"on-call" fires or attacks), and these targets have been designated high priorities requiring immediate response, then the command vehicle is a TOO *and* a surface TCT. TOOs are classified as **immediate targets**, either **unplanned** or **unanticipated**. Most TOOs are unanticipated. See Figure II-2.

3. Attacks Against Surface TCTs—The Challenge

Attacks against surface TCTs are characterized by preemptive or reactive offensive actions intended to destroy land or sea TCTs as part of counterair, strategic attack, interdiction, fire support, maneuver, antisurface warfare, strike warfare, amphibious operations, or special operations.

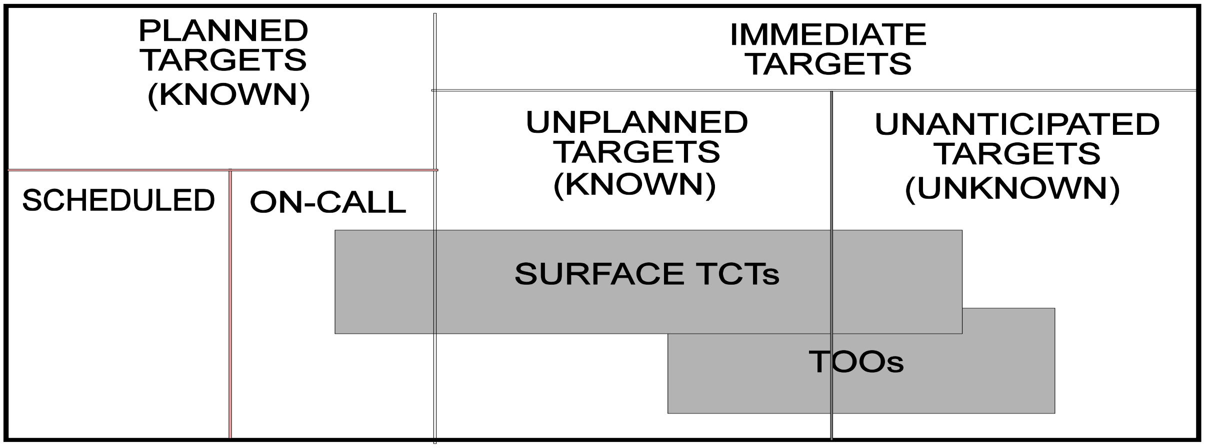

Figure II-2. TOO Relationship to Surface TCTs and Immediate Targets

Attacks against surface TCTs are similar to attack operations as defined in Joint Pub 3-01.5, *Doctrine for TMD*, but are not solely limited to enemy operational area TBM capabilities. Each component has the capability to locate and attack surface TCTs in mutually accessible areas of interest. Given the state of current and future sensor systems, a surface TCT could be identified by more than one component simultaneously. As such, the JFC must establish means to effectively eliminate the threat without causing fratricide or duplication of effort among components. All the while, this must be accomplished across several levels of command within and across component/ service lines.

a. Joint force planning and execution of surface TCT targeting operations require a delicate balance of flexibility and control that must be maintained over large operational areas and numerous complex weapon systems. Synergy, momentum, and unity of effort must be maintained in order to achieve the JFC's intent.

b. Ideally, a common "picture" of the battlefield shared by all components focuses the targeting effort, especially if near-real-time (NRT) information (such as that available from the Joint Surveillance Target Attack Radar System [Joint STARS]) is available. National and operational area sensors, data links, and C2 systems provide the information on which the joint force and component commanders are able to make decisions and exercise control over their forces. However, current JTF C2 systems do not allow unified, real-time coordination and deconfliction of all forces. Likewise, national and in-theater sensors do not necessarily provide all components with a "common picture" of the battlefield.

(1) For example, the Joint STARS platform, considered to be a critical JFC tool for real-time surface surveillance, provides two separate data links to different components. The surveillance control data link (SCDL) sends "preprocessed" data to land and amphibious (ground element) component operations center ground station modules (GSMs) while JTIDS "filtered" data is transmitted to the air component and amphibious (air element) operations centers. Essentially, the ground elements have a different picture of the battlespace than the air elements.

(2) Similarly, the All Source Analysis System (ASAS) cannot transmit the land/ amphibious component's view of the battlespace to the air component's Theater Integrated Situation Display (TISD). As a result, each component views the battlespace from their unique perspective.

c. This deficit in structure and systems may make it difficult to efficiently apply joint force assets against potential targets on a real-time or NRT basis with complete situational awareness, economy of force, and synchronization of effort. Until C2 structures and sensor systems are improved, JFCs must establish procedural fixes to effectively deal with surface TCTs.

4. JFC's Objectives and Guidance for Surface TCTs

During the commander's objectives and guidance phase, the JFC/component commander designates specific surface TCTs as priority requiring immediate response. Also, the JFC establishes specific guidance on how coordination, deconfliction, and synchronization will occur among components assigned in the operational area. Once this guidance is set forth, planned and reactive procedures for attacking surface TCTs are established. JFC guidance sets the basic procedural framework for the components to comply with the commander's intent and expedite targeting of surface TCTs. JFC objectives and guidance to component commanders enable and support different phases of the joint targeting process. Examples are—

a. Identification and assignment of primary sensors and weapon systems specifically assigned to support attacks on surface TCTs (**target development**).

b. Establishment of planned, deconflicted fire areas (with definable trigger events) against specific surface TCTs (**target development**).

c. Directives to component commanders to task assets for standby or secondary missions as backup to primary sensors and weapon systems. An example would be the JFACC designating aircraft most likely to be diverted to assist attack operations (**weaponeering and force application**).

d. Determination of surface TCT engagement authority based on either component commander area of operations (AO), component commander assigned mission, or combination thereof (**force application**).

e. If necessary, specification of those few, exceptional circumstances when component commanders who first acquire specific surface TCTs have authority for immediate engagement responsibility regardless of assigned AO or mission. In other words, the JFC should determine those situations, if any, where immediate destruction of the imminent surface TCT threat outweighs the potential for fratricide or duplication of effort. Inherently, this determination, to whatever degree, may allow a component to bypass the requirement for informing, coordinating, deconflicting, and synchronizing. However, if time allows, these efforts should be accomplished before engagement. The JFC must carefully balance the risk between the surface TCT threat and the potential for fratricide (**force application and execution planning/force execution**).

f. Identification of specific communication/data links between component C2 elements to conduct rapid coordination. This includes authorizing direct liaison and coordination authority (**execution planning/force execution**).

g. Establishment of priority "quickfire" sensor to shooter communication links with defined conditions for circumventing/bypassing normal command/coordination channels, to improve timeliness of response (**execution planning/force execution**).

5. Availability of Surface TCT Capable Attack Assets

Generally, the primary weapon systems suitable for surface TCT attacks in an operational area are fixed-wing fighter/attack aircraft, attack helicopters, the Army Tactical Missile System (ATACMS), Multiple Launch Rocket System (MLRS), conventional artillery, conventional air launched cruise missiles (CALCMs), Navy Tomahawk Land Attack Missiles (TLAMs), naval surface fire support (NSFS), and SOF. If the numerical availability of surface TCT capable attack assets within the operational area is weighted significantly in favor of one weapon system, it will greatly affect JFC guidance in regard to the weaponeering assessment phase for surface TCT attacks. As such, the JFC may be required to adapt guidance based upon available weapon systems. If forces within the operational area are not significantly weighted toward one weapon system or the other, the JFC should consider procedures that allow maximum flexibility in the attack of surface TCTs after considering all weapon system options. If one component cannot strike a surface TCT (due to reloading, weather, limited range capability, etc.), procedures must allow for rapid handover to another component for mission execution.

6. Determination of "Best Capable" Surface TCT Asset

Determination of "best capable" surface TCT asset (such as fixed-wing aircraft, ATACMS, TLAM, etc.) begins during the weaponeering assessment phase and continues through the force application phase. Individual component commanders provide recommendations to the JFC highlighting the pros and cons of their available weapon systems based upon the current situation. The JFC also provides guidance to component commanders to allow them the flexibility to make the proper decision regarding rapid selection of "best capable" attack asset. **(*Note: The land and amphibious component commanders use the AGM for this purpose, as it offers primary and alternate weapon selection options, thereby expediting execution decisions.*)** Determination of "best capable" requires the assessment of five subjective factors:

a. **Effectiveness**. Depending on the desired effects, appropriate weapons must be selected. Some surface TCT attack assets may be highly effective in destroying *unhardened* surface TCTs (such as TLAM or current version ATACMS). Destruction of *hardened* surface TCTs (that is, sheltered) may require other attack assets such as aircraft delivered precision-guided munitions (PGMs), laser guided bombs (LGBs), or SOF infiltration and sabotage.

b. **Responsiveness**. Once surface TCTs are detected, weapon responsiveness is critical to ensure the attack opportunities are not lost. Responsiveness can be measured in the elapsed time required from receipt of an execution order to weapons impacts/ effects, including the time required for weapons deconfliction, if applicable. Responsiveness is also measured by whether or not the chosen weapon system can operate under the current weather/illumination conditions (such as all-weather, day-night systems versus day only and fair weather systems).

c. **Range**. Selected weapon systems must have the range capability to enable them to attack. **(*Note: Range may not be a factor for in-country SOF team operations.*)**

d. **Accuracy**. The weapon system must be able to accurately acquire the target. Moving targets, with large target location errors (TLEs), require accurate predicted locations. End game accuracy is accomplished by weapon systems able to refine the search for moving targets once overhead (such as fixed-wing aircraft) or weapon systems with area coverage submunitions that compensate for anticipated target movement (such as ATACMS).

e. **Threat**. Potential TCTs may emerge in heavily defended areas.

(1) The existence of a significant air defense threat may obviate the use of manned nonstealthy fixed-wing aircraft, rotary-wing aircraft, and cruise missiles as strike assets. The employment of guns, rockets, missile artillery, or stealth aircraft may be required to achieve an acceptable probability of damage. If air-delivered precision munitions must be employed against such heavily defended TCTs to ensure adequate destruction, suppression of enemy air defenses (SEAD) fires, or EC support may be required.

(2) The existence of a significant ground threat may preclude the insertion or operations of SOF teams.

Overall, the JFC has several surface TCT capable attack assets with varying degrees of effectiveness, responsiveness, range, accuracy, and threat. However, no one weapon system encompasses the best of all of these characteristics under all conditions. No one weapon system is always "best capable" to deal with the surface TCT threat.

7. Planned Procedures for Attacking Surface TCTs

The extent of planned procedures for attacking surface TCTs determines the probability of joint force success in carrying out the mission. The more planning accomplished, the higher the probability of mission success. The transient or fleeting nature of surface TCTs requires shorter execution cycles for attacks to be successful. The majority of surface TCTs, as immediate targets, are difficult to insert into traditional targeting mechanisms for planned targets. However, the JTF can compensate for this through the use of various fixes, such as on-call ATACMS fire missions, airborne surface TCT combat air patrols (CAPs), and airborne attack aircraft divert procedures. During these immediate taskings, the joint targeting process described in Chapter I still applies, yet occurs on a very accelerated timeline. Timely execution of the joint targeting process may require preestablished, streamlined C2 arrangements tailored to expedite the flow of targeting information and execution decisions. Timely execution of attacks against immediate surface TCTs requires the JFC to establish, in advance, procedures for components to effectively carry out attacks. Planned procedures include but are not limited to—

- Control and coordinating measures.
- FSCL procedures.
- Attack options with an FSCL.
- Attack options without an FSCL.
- Airspace coordination area (ACA) options.
- Common reference systems.
- Weapon system procedures.

a. **Control and Coordinating Measures**. JFCs employ various maneuver and movement control and fire support coordinating measures to facilitate effective joint operations.[2] These measures may be used to expedite attacks against surface TCTs. Joint control and coordination measures apply to all JTF components, and as such, the JFC has final approval authority. The JFC is responsible for ensuring coordination measures are appropriate, function as designed, and are well understood. These measures include use of boundaries, fire support coordination measures (FSCMs), and airspace control measures (ACMs).

(1) Boundaries. Boundaries are maneuver control measures that define surface areas to facilitate coordination and deconfliction of operations. JFCs use lateral, rear, and forward boundaries to define AOs for land and naval forces.[3] Boundaries give the JFC the ability to clearly define areas requiring coordination and deconfliction of surface TCT attacks between components and units. The JFC will normally establish the land or amphibious force commander's forward boundary, and adjust as necessary, to balance the land force commander's need to rapidly maneuver with the JFACC's need to rapidly mass and employ airpower with minimal constraints.

(a) Theater air sorties are not constrained by land boundaries, per se. However, because the airspace above surface areas is used by all components of the joint force, JFCs promulgate ACMs to deconflict the multiple uses required of this space.[4] Airspace is not constrained by boundaries in terms of movement of aircraft; however, attacks by aircraft that occur within a surface force's boundary require an appropriate degree of coordination.

(b) A naval boundary may be designated for seas adjacent to the area of land conflict to enhance coordination and execution of naval operations.[5]

(c) Boundaries may require relatively frequent adjustment based on the actual and projected rate of maneuver and the operational environment.[6] The frequency of change will have direct impact on the deconfliction of firepower employment within the joint force. Change of these boundaries by the JFC must be communicated to all affected components of the joint force.

(2) FSCMs. FSCMs and associated procedures assist in the C2 of joint forces. Within their AOs, land and amphibious commanders employ permissive and restrictive FSCMs to enhance the expeditious attack of targets; protect forces, populations, critical infrastructure, and sites of religious or cultural significance; and set the stage for future operations. Commanders position and adjust FSCMs consistent with the operational situation and in consultation with superior, subordinate, supporting, and affected commanders.[7] FSCMs are identified by location and date/time effective (as well as termination date/time, if applicable). FSCMs, when used properly, aid in the rapid engagement of surface TCTs. FSCMs should not be used to constrain operational flexibility but rather enhance the operational scheme. At the JTF level their use must be carefully considered and closely coordinated because of the impacts on component efforts to support JFC objectives.

(a) Permissive Measures. These measures are normally used to authorize the attack of targets without coordination from the establishing commander (within the commander's applicable boundaries) if certain circumstances are met. While the circumstances are situationally dependent, it is imperative they be closely coordinated with the other components of the joint force. Permissive measures provide the JFC the ability to rapidly *coordinate and synchronize* fires and attacks between components and units. Permissive measures include free fire areas (FFAs), coordinated fire lines (CFLs), and the fire support coordination line (FSCL).

• FFAs are specifically designated areas into which any weapon system may be fired without any additional coordination. FFAs do not adequately deconflict between air and surface attacks on surface TCTs unless they are combined with adequate ACMs. FFAs are established by the appropriate ground commander.

• CFLs are lines beyond which conventional surface fire support means (such as ATACMS, TLAM, or NSFS) may fire at any time within the zone of the establishing headquarters without additional coordination.[8] Typically, CFLs are used by land and amphibious forces. CFLs *expedite* surface TCTs attacks as long as indirect fire (surface to surface) means are used. (***Note: A CFL is sometimes referred to as a no-fire line by other nations.***) CFLs do not adequately *deconflict* surface TCT attacks by fixed-wing aircraft. CFLs are established by the appropriate ground commander and should be placed as close as practical to the forward line of own troops (FLOT).

• An **FSCL** is a permissive FSCM. See subparagraphs b, c, and d for further information on the FSCL.

(b) Restrictive Measures. Restrictive measures are used to restrict the use of fire support assets in particular areas. They may be established by any component commander and are normally applicable to all subordinate elements. Restrictive measures also provide the JFC the ability to *deconflict* fires and attacks between components and units. Commanders employ restrictive measures to enhance the protection of friendly forces operating beyond an FSCL.[9] This applies to measures both inside and outside AO/amphibious objective area (AOA) boundaries. Examples of restrictive measures are no fire areas (NFAs), restrictive fire lines (RFLs), restrictive fire areas (RFAs), and ACAs.

• NFAs are areas into which no fires or effects can enter. The purpose of an NFA is to protect forces operating forward of the FLOT or to protect areas, friendly or enemy, that may serve a purpose in future operations. SOF NFAs are of particular importance. An NFA will be identified by a central grid coordinate and a radius in nautical miles from that point. Fire or attacks into an NFA are authorized under two exceptions:

• • The establishing headquarters approve on a mission-by-mission basis.

• • Immediate force protection is necessary and the response used is the minimum force required.

As such, component attacks against surface TCTs located in NFAs require either approval or disregard for coordination. Therefore, to expedite attacks, NFA use should be minimized in areas of expected surface TCT locations. NFAs are established by the appropriate ground commander.

• RFLs are lines established between converging forces that prohibit fires or the effects of fires across the lines without coordination from the establishing headquarters. RFLs *deconflict* component surface TCT attacks "by default." RFLs aid in deconfliction but limit the JFC's flexibility and responsiveness by increasing the amount of coordination required. RFLs assist in the prevention of fratricide among conventional forces. RFLs are established by the appropriate ground commander.

• RFAs regulate and control fire and attacks into an area according to stated restrictions. Surface TCTs acquired within an RFA may only be attacked in accordance with the firing restrictions, unless the establishing authority approves otherwise. As with RFLs, RFAs similarly aid in deconfliction but limit the JFC's flexibility and responsiveness in coordinating other component attacks into the area. RFAs are established by the appropriate ground commander.

• ACAs are three-dimensional blocks of airspace with defined dimensions that significantly enhance deconfliction of surface TCT attacks among components. Friendly aircraft are reasonably free from friendly surface fires, with artillery, helicopters, and fixed-wing aircraft given specific lateral or vertical airspace within which to operate. Timely implementation of the area is dependent on the ground situation. Burden of deconfliction rests with the ground commander. An ACA is established by the airspace control authority at the request of the appropriate ground commander.[10] Also see subparagraph e, Airspace Coordination Area Options, for more information on ACAs. *(**Note: Airspace control area and airspace control authority are defined by the acronym "ACA."**)*

(3) ACMs. The airspace in a combat zone is a crucial dimension of the battlespace used by all components of the joint and allied forces to conduct assigned missions. A high concentration of friendly surface, subsurface, and air-launched weapon systems must share this airspace without unnecessarily hindering combat power that is being applied in accordance with the JFC's campaign or operational plan. The goal of combat zone airspace control is to enhance air, land, maritime, and SOF effectiveness in accomplishing the JFC's objectives.[11] The JFC designates the airspace control authority (normally the JFACC) who is responsible for developing, coordinating, and publishing airspace control procedures and for operation of the airspace control system in the AOR/JOA. The airspace control authority establishes an airspace control plan (ACP) that includes procedural ACMs. Specific ACMs useful for surface TCT attacks are restricted operation areas (ROAs), high density airspace control zones (HIDACZs), minimum risk routes (MRRs), and special use airspace. Airspace coordination areas (as restrictive FSCMs) are also published in the ACP.

(a) A ROA is airspace of defined dimensions created in response to specific operational situations or requirements within which the operation of one or more airspace users is restricted. It is also known as a restricted operations zone (ROZ).[12] ROAs/ROZs significantly aid in the deconfliction of surface TCT attacks and prevent duplication of effort and potential fratricide by closely restricting airspace access over a designated surface area. ROAs/ROZs are established by the airspace control authority.

• During surface TCT attacks, ROAs/ROZs can be used to restrict air operations over ATACMS battery launch areas, also referred to as platoon airspace hazard areas (PAHs). Similarly, they can be used over predicted ATACMS munitions impact points, also referred to as target airspace hazard areas (TAHs).

• ROAs/ROZs can be used to sanitize and limit airspace to only aviation operations (similar to an ACA).

• ROAs/ROZs are effective in protecting SOF operations areas.

(b) An HIDACZ is an area in which there is a concentrated employment of numerous and varied weapons or airspace users. An HIDACZ has defined dimensions that usually coincide with geographical features or navigational aids. An HIDACZ restricts use of the airspace because of the large volume and density of fires supporting the ground operations within the described geographic area.[13] An HIDACZ is nominated by the ground commander and approved by the airspace control authority.[14] An HIDACZ may be used similar to ROAs/ROZs and ACAs.

(c) MRRs. An MRR is a temporary corridor of defined dimensions recommended for use by high-speed, fixed-wing aircraft that presents the minimum known hazards to low-flying aircraft transiting the combat zone. MRRs are established considering the threat, friendly operations, known restrictions, known fire support locations, and terrain.[15] MRRs may also be used by rotary-wing aircraft. MRRs are established by the airspace control authority.

(d) **Special use airspace** is a term used to define airspace for a specific purpose. It may also designate airspace in which no flight activity is authorized.[16] Special use airspace is typically applied to CAP/orbit areas. CAP/orbit areas provide the JFC with flexibility for responsive aircraft attacks against surface TCTs. CAP/orbit areas are defined by location, orientation, altitude, and vulnerability time, and allow the JFACC and other component commanders to preposition air assets for surveillance, reconnaissance, air defense, battle management, and anticipated airstrikes. Special use airspace is established by the airspace control authority.

(e) Normally, ROAs/ROZs and CAP/orbit areas are under the control of an airborne element of the Theater Air Control System (AETACS). AETACS includes platforms such as the Airborne Warning and Control System (AWACS) and Airborne Battlefield Command and Control Center (ABCCC). Additionally, E-2C surveillance aircraft and direct air support center-airborne (DASC-A) aircraft may control ROAs/ROZs and CAPs/orbit areas as assigned by the airspace control authority.

(f) Further information on ACMs may be found in Joint Pub 3-52, *Doctrine for Joint Airspace Control in the Combat Zone;* Joint Pub 3-56.1, *Command and Control for Joint Air Operations*; and FM 100-103-1/FMFRP 5-61/NDC TACNOTE 3-52.1/ACCP 50-38/PACAFP 50-38/USAFEP 50-38, *ICAC2—Integrated Combat Airspace Command and Control*.

b. **FSCL Procedures**. FSCLs are permissive FSCMs. They are established and adjusted by appropriate land or amphibious force commanders within their boundaries in consultation with superior, subordinate, supporting, and affected commanders. Forces attacking targets beyond an FSCL must inform all affected commanders in sufficient time to allow necessary reaction to avoid fratricide, both in the air and on the ground.[17]

(1) The FSCL is not a boundary—the synchronization of operations on either side of the FSCL is the responsibility of the establishing commander out to the limits of the land or amphibious force boundary.[18] The FSCL does not divide AOs. In particular, it is not a boundary between the land or amphibious commander and the JFACC.

(2) Use of an FSCL is not mandatory. However, the land or amphibious commander must realize that not using a FSCL will require other components to extensively coordinate all attacks into the AO.

(3) Situations may arise where two or more components establish separate FSCLs. For example, the land component commander establishes an FSCL in the AO, and the amphibious commander establishes an FSCL in the AOA. In cases such as these, if the components share a mutual boundary, the JFC may choose to establish a mutual FSCL applicable to the joint force as a whole.

(4) By establishing an FSCL at sufficient depth so as to not limit high-tempo maneuver, land or amphibious force commanders ease the coordination requirements for attack operations within their AOs by forces not under their control, such as naval gunfire or air interdiction.[19]

(a) Placement of the FSCL is based on the type of mission, threat, terrain, and concept of the operation, as well as organic weapons capabilities, location of friendly and enemy forces, anticipated rates of movement, and tempo of the operation. Careful consideration and judicious placement should be exercised as there are significant trade-offs between close and deep FSCLs.

• Close placement of the FSCL may be used in defensive operations and when rapid movement of land component forces is not expected. The benefit of a close FSCL would be the greater ability for supporting components to execute attacks without the requirement of extensive coordination.

• Deep placement of the FSCL facilitates high-tempo maneuver and may be used in rapidly advancing, offensive situations. However, it will limit operational freedom for supporting component operations behind the FSCL, due to the requirements for increased coordination and tighter, positive and procedural controls (for example, close air support [CAS] or air interdiction [AI] behind the FSCL).

(b) It is up to the land or amphibious force commander to place the FSCL so as not to inhibit operational tempo and maximize the use of all organic and supporting component assets. Fundamentally, FSCL placement is situational and may be changed as required to maximize success of the campaign. It is incumbent upon each component commander to provide key inputs to aid in placing the FSCL in the best location to support the JFC's objectives.

(5) The land or amphibious force commander adjusts the location of the FSCL as required to keep pace with operations. In high-tempo maneuver operations, the FSCL may change frequently, such as every several hours. The establishing commander quickly transmits the change to higher, lower, adjacent, and supporting headquarters to ensure attack operations are appropriately coordinated by controlling agencies. Anticipated adjustments to the location of the FSCL are normally transmitted to other elements of the joint force sufficiently early to reduce potential disruptions in their current and near-term operations.[20] Component commanders must receive notification of pending FSCL change as soon as possible. Timely notification (normally 6-8 hours) of a change in the FSCL status or location will allow effective coordination with other components. However, some tactical situations could result in less advance notice.

(6) "On-Order" FSCLs. The land or amphibious force commander may choose to plan "on-order" FSCLs throughout the AO/AOA which can be rapidly established and adjusted. These "on-order" FSCLs are similar

to movement phase lines established at designated distances across the AO/AOA. The advantage of "on-order" FSCLs is that they allow the land or amphibious force commander the flexibility to rapidly coordinate the change of the currently established FSCL to another planned FSCL as the tempo of land operations/movement increases. This is equally advantageous in offensive operations as it is in defensive, retrograde operations. Coordination among other component C2 agencies is simplified if the locations of these "on-order" FSCLs have been previously transmitted to the joint force in advance. Use caution not to clutter operational graphics/maps with too many "on-order" FSCLs, as this may lead to confusion and outweigh the benefits of the planned measure.

(7) The FSCL should follow well-defined terrain features. It should also be defined by a series of latitude and longitude points for ease of transmission via component C2 agencies. However, FSCLs do not have to follow traditional "straight-line" paths. Curved and enclosed, "circular" FSCLs have applications in nonlinear joint operations.

c. **Attack Options With an FSCL**. With an established FSCL, there are two geographic areas requiring deconflicted surface TCT attacks:

(1) Attacks Short of the FSCL. Short of an FSCL, all air-to-surface and surface-to-surface attack operations are controlled by the appropriate land or amphibious force commander.[21] This area also has the highest potential for fratricide. Surface TCT attack operations conducted in this area may require similar coordination and deconfliction procedures as those required for CAS if detailed integration and friendly forces are factors. To ensure sufficient control and safety of friendly forces, a component desiring to attack a surface TCT short of the FSCL must receive permission from the AO/AOA component commander and operate under positive control measures when necessary. See Joint Pub 3-09.3, *JTTP for CAS*, for additional information.

(a) Positive control is normally coordinated through the corps fire support element (FSE) or the Marine air ground task force (MAGTF) fire support coordination center (FSCC).

(b) Fighter/attack assets attacking surface TCTs short of the FSCL first coordinate with a designated C2 platform or center, such as an ABCCC, a DASC-A, an air support operations center (ASOC), or direct air support center (DASC). These elements will then coordinate with the FSE/FSCC.

(c) Approved missions will normally be handed off for positive terminal control by a forward air controller-airborne (FAC-A), tactical air control party (TACP), or air naval gunfire liaison company (ANGLICO), if required. Missions not handed off to a FAC-A, TACP, or ANGLICO will only be those surface TCT attack missions (such as AI) where close integration with ground forces is not required and friendlies are not a factor in the intended target area. Although rare, this may sometimes occur between the FLOT and FSCL.

(2) Attacks Between the FSCL and the Forward Boundary. Coordination of attacks beyond the FSCL is especially critical to commanders of air, land, and SOF. Their forces may now be operating beyond an FSCL or may plan to maneuver on that territory in the future. Such coordination is also important when attacking forces are employing wide-area munitions or munitions with delayed effects. Finally, this coordination assists in avoiding conflicting or redundant attack operations. In exceptional circumstances, the inability to conduct this coordination will not preclude the attack of targets beyond the FSCL. However, failure to do so may increase the risk of fratricide and could waste limited resources.[22]

(a) Normally, when the land or amphibious force commander establishes an FSCL, it facilitates the JFACC's ability to rapidly conduct attacks between the FSCL and forward boundary as the JFC assigned supported commander for overall air interdiction, counterair, and strategic attack missions. The land or amphibious force commander may conduct attacks *within the same area*. Consequently, the potential exists for conflict between air and land forces conducting attacks. It is crucial the appropriate degree of coordination, deconfliction, and synchronization takes place between respective C2 centers to prevent fratricide and duplication of effort, manage risks, and maximize results during attacks between the FSCL and the forward boundary. To assist in this coordination, the land/amphibious component commander should relay target priority, effects, and timing of interdiction operations within their AO/AOA to the JFACC and other component commanders.

(b) Attacks on surface TCTs between the FSCL and the forward boundary should not violate established FSCMs, ACMs, directives, or protected target lists. Such measure may be sufficient coordination for surface TCT attacks. However, rapid deconfliction of attacks sometimes requires further information be passed among components in order to keep the affected component commander informed of activities within the AO/AOA and their potential impact on planned future operations.

• Component commanders may establish rapid coordination and deconfliction via direct voice and data links between any combination of airborne and surface C2 agencies. Typical links may include (but are not limited to) ABCCC to FSE, DASC-A to FSCC, and Joint STARS to the force projection tactical operations center (FPTOC) and combat operations division (COD) of the joint air operations center (JAOC).

• Minimum elements of information to be transmitted are—

• • Target description.

• • Target coordinates (latitude (LAT)/longitude (LONG) and/or universal transversal mercator [UTM]).

• • Target number or identifier (as assigned).

• • Common reference system (grid box/bullseye).

• • Weapon type/effects desired.

• • Weapon firing position/ attack origination.

• • Time of attack/weapon time of flight.

• • CA of attack once complete (BDA).

d. **Attack Options Without an FSCL**. If an FSCL is not established, component commanders must develop procedures for coordination and deconfliction of surface TCT attacks. These procedures will be approved by the JFC. In those cases without an established FSCL, there are two geographic areas requiring deconflicted surface TCT attacks:

(1) Attacks Inside the AO/AOA. Normally, an AO/AOA without an FSCL severely restricts rapid attacks against surface TCTs. Since an AO/AOA with no FSCL is restrictive in nature, component commanders may make use of permissive and restrictive FSCMs (such as ACAs, FFAs, and RFAs) and airspace control measures (such as MRRs and ROZs) to coordinate and deconflict attacks. (***Note: CAS missions will be conducted per Joint Pub 3-09.3, JTTP for CAS.***)

(2) Attacks Outside the AO/AOA. FSCLs are not normally established outside of an AO/AOA. Coordination of attacks on surface TCTs outside component AOs/AOAs will be as directed by the JFC and in accordance with the supported and supporting component commander relationships established in Joint Pub 3-0, *Doctrine for Joint Operations* and Joint Pub 3-56.1, *Command and Control of Joint Air Operations*.

e. **Airspace Coordination Area Options**. ACAs allow simultaneous component attacks of surface TCTs in close proximity to each other by multiple attack means, of which one is normally air. ACAs are designed with a minimum altitude, maximum altitude, specified width/length, and defined off of a line between two coordinate points. Friendly fires are not permitted through established ACAs. Fires above, below, and outside the boundaries of an established ACA are authorized. The FSE/FSCC must advise the applicable Army airspace command and control (A2C2)/Marine airspace control element of fires in close proximity to ACA entry and exit points. The A2C2/Marine element will coordinate with the ASOC/DASC, ABCCC/DASC-A, AWACS/E-2C, or the airspace managers in the JAOC to ensure aircraft using the ACA are aware of the close proximity of fires. Formal and informal ACAs exist, with several techniques for deconfliction.

(1) Formal ACA. The airspace control authority establishes formal ACAs at the request of the appropriate ground commander. Formal ACAs require detailed planning. Though not always necessary, formal ACAs should be considered. The vertical and lateral limits of the ACA are designed to allow freedom of action for air and surface fire support for the greatest number of foreseeable targets. Since only the fire direction center (FDC) can determine the trajectory for a specific battery firing at a specific target, each target must be evaluated in the FDC to ensure the trajectories of the artillery rounds do not penetrate the ACA. The fire support coordinator (FSCOORD [US Army] or FSC [USMC]) should consult the FDC when deciding the altitude of an ACA to determine if that altitude would allow the majority of targets to be attacked without interference or problems.[23]

(2) Informal ACA. Informal ACAs can be established using separation plans and may be established by any maneuver commander. Aircraft and surface fires may be separated by distance (lateral, altitude, and combination of lateral and altitude) or by time. Distance separation requires less detailed coordination between aircraft and firing units but can be the most restrictive for aircraft routing. Fire support personnel should select the separation technique that requires the least coordination without adversely affecting the aircrew's ability to safely complete the mission.[24]

(a) Lateral Separation. Lateral separation is effective for coordinating fires against targets that are adequately separated from flight routes to ensure aircraft protection from the effects of friendly fires. This is an appropriate technique when aircrews and firing units engage separate targets (at least 500 meters apart) and aircraft will not cross gun-target lines.[25] Safe lateral separation between ATACMS and aircraft engaging separate surface TCTs may require more than 500 meters distance.

(b) Altitude Separation. Altitude separation is effective for coordinating fires when aircrews will remain above indirect fire trajectories and their effects. This technique is effective when aircrews and firing units engage the same or nearby targets.[26] This technique works exceptionally well when simultaneous indirect fire and air attacks are executed on surface TCTs.

(c) Altitude and Lateral Separation. Altitude and lateral separation is the most restrictive technique for aircrews and may be required when aircraft must cross the firing unit's gun-target line.[27] This technique is especially effective for deconflicting aircraft attacking surface TCTs underneath the flight path of an overflying ATACMS trajectory.

(d) Time Separation. Time separation requires the most detailed coordination and may be required when aircrews must fly near indirect fire trajectories or ordnance effects. The timing of surface fires must be coordinated with aircraft routing. This ensures that even though aircraft and surface fires may occupy the same space, they do not do so at the same time. All timing for surface fires will be based on the specific aircraft event time (time on target [TOT]/time to target [TTT]). This technique is appropriate when aircrews and firing units engage the same or nearby targets. Consider weapons fragmentation envelope and the likelihood of secondary explosions when deconflicting sorties.[28] Though normally used in a CAS scenario with a terminal controller, this technique may be used in coordinated attacks against surface TCTs. However, its usefulness in deconfliction is excessively complicated by the need for detailed timing. In deep attack scenarios, a terminal controller may not be available to coordinate the time separation. Attack aircraft may require a radio relay platform (such as an AETACS) to communicate with the FDC. The inherent delays of radio relay may result in a loss of a timely opportunity to attack the surface TCT.

f. **Common Reference Systems**. Common reference systems provide a universal, joint perspective with which to define specific areas of the battlespace, enabling the JFC and component commanders to efficiently coordinate, deconflict, and synchronize surface TCT attacks. These reference systems are especially useful when used to describe mutually accessible areas of attack and rapidly deconflict assigned attack operations. Once identified, these areas may be protected by control and coordinating measures (in particular FSCMs and ACMs), thereby enabling unhampered precision attack and flexibility of weapon system employment. Common reference systems result in rapid, deconflicted surface TCT attacks, enhanced probability of mission success, and reduced potential for duplication of effort and fratricide. Also, they allow for rapid coordination of joint engagement and the employment of combined arms. Additionally, they are flexible enough to be used for a variety of other purposes, such as geographically identifying search and surveillance areas, identification of restricted zones, and designation of high threat areas (such as enemy SAM battery locations). The primary purpose of these stems is to provide a common frame of reference for joint force situational awareness.

(1) "Grid Box" Reference System. The "grid box" reference system is an administrative measure highly useful in facilitating rapid attacks on surface TCTs. This reference system may be used to rapidly and clearly define geographical location for attack coordination, deconfliction, and synchronization. Components may use the grid box system to identify the area of intended attack to other components. After a target is acquired and areas of intended attack are designated by alphanumeric grid, the identifying component establishes appropriate control and coordinating measures (such as FSCMs and/or ACMs) to expedite and deconflict attacks with other components. Grid boxes themselves are not FSCMs or ACMs but simply a common reference system that complements established fire support/airspace control systems and measures. Normally, FSCMs and/or ACMs established in grid box areas should be of a temporary nature, protecting singular component attack operations only for as long as operationally necessary. The purpose is rapid deconfliction. As such, grid box identification is only temporary. Some situations warrant simultaneous joint engagements within a single grid box area. Appropriately constructed FSCMs and/or ACMs (such as informal ACAs with altitude separation) allow for massed attacks against surface TCTs. Unlike the "kill box" concept used solely by the JFACC during Desert Storm, each component commander, as well as the JFC, can use a joint "grid box" reference system to facilitate deconfliction and execution of attacks against surface TCTs throughout the operational area. This reference system allows the JFC and component commanders to clearly communicate information, establish a common frame of reference, and enable joint force prosecution of surface TCTs with multiple weapon systems. ***The grid box reference system is extremely useful in the area between the FSCL and the forward boundary, where it is highly possible more than one component may be conducting attacks***. This system, when properly employed by the joint force, facilitates component commander requirements to

inform all other affected commanders when attacking targets both inside and beyond an FSCL (as directed in Joint Pub 3-0, *Doctrine for Joint Operations*, page III-34.)

(a) Basic Considerations. Grid boxes designate specific horizontal surface areas and their associated volumes of airspace. Design is situationally dependent on mission, enemy, terrain and weather, troops and support available, and time available (METT-T) and IPB. Basic considerations when designing grid boxes are planned weapons effects and planned weapon system employment tactics.

• Planned Weapons Effects. Weapons effects, attack profiles, and attack system maneuverability determine the size of a grid box.

• • For indirect fires, this size is dependent on the munition and associated submunition; number of rounds; single tube (or launcher) verses massed fires (platoon/battery/battalion); accuracy/precision of fires; and safety/buffer zones incorporating fragmentation patterns.

• • For air delivered munitions from fixed- and rotary-wing aircraft, grid box size is dependent on maneuver requirements, aircraft per flight; accuracy/precision capability of the aircraft and/or weapon; munition; quantity of weapons delivered per aircraft; and maximum fragment travel distances.

• Planned Weapon System Employment Tactics. Weapon system employment tactics also determine the size of a grid box.

• • For indirect fire weapons, this size is dependent on the number of systems in effect; associated gun-target line(s), projectile trajectory(ies); and missile flight path(s).

• • Aircraft considerations are dependent on the airspace required to safely and effectively maneuver the aircraft (or flight of aircraft) during weapons delivery, based on delivery tactics and parameters. Dimensions should allow for freedom of aircraft movement within the grid box without inhibiting precision targeting and delivery.

(b) Dimensions. Basic considerations of planned weapons effects and weapon system employment tactics determine the appropriate size of a grid box based on the employment of a *single* weapon system. However, since the grid box system should be a common reference for all joint force components, it must be simple and flexible enough to adapt to the requirements of *any* available weapon system. As such, the JFC may determine the *optimum* dimensions of a grid box and use it as a *standard baseline* applicable to the majority of joint force operations where rapid deconfliction is required. Dimensions should be based on the largest order of magnitude expected and allow for further adjustment and downsizing as necessary. Optimum grid box sizes should accommodate the most restrictive weapon system employment tactic, yet allow flexibility (through further subdivision), so as to not overly restrict other weapon system employment. In order for the grid box system to be simple and easy to use, the grid boxes should be based on lines of latitude and longitude that are printed on the maps in use in the theater.

• Horizontal Dimensions. The optimum horizontal dimensions of a standard baseline grid box are 15 minutes of latitude by 15 minutes of longitude. This is the surface area required to accommodate *most* fixed-wing employment tactics (normally, the largest order of magnitude for weapon system employment tactics). Such a grid box will measure **approximately** 15 nautical miles (NM) x 15 NM. Exact size may vary depending on latitude (Figure II-3). LAT/LONG references easily define grid boxes since they are common and exist on most military operational graphics and charts.

• • Of particular use are 1:250,000 scale Joint Operational Graphic-

Air (JOG-Air) charts, that display both LAT/LONG and UTM scales.

• • 15 x 15 minute LAT/LONG grid box dimensions are particularly advantageous because they also encompass a single 1:50,000 UTM topographical line chart.

• • In the absence of charts with both LAT/LONG and UTM coordinates, handheld precision locating ground reference (PLGR) devices can be used to convert LAT/LONG coordinates into UTM coordinates and vice versa.

• • All grid box dimensions should be defined using World Geodetic Survey (WGS)-84 Datum Plane charts unless operational requirements dictate otherwise. In cases where only WGS-72 Datum Plane charts exist, use caution in the conversion of WGS-72 data to WGS-84 data.

• Horizontal Subdivision. If desired, and as necessary, the standard baseline grid box may be further subdivided so as to not overly restrict other weapon system employment. Two such methods are—

• • Four subdivisions, 7.5 x 7.5 minute LAT/LONG.

• • Nine subdivisions, 5 x 5 minute LAT/LONG.

For example, attack helicopter operations may only require a 7.5 x 7.5 minute LAT/LONG subdivided grid box. (Figure II-4A). Similarly, ATACMS do not require an ACM (PAH/TAH ROZ) the size of a standard baseline grid box. Most ATACMS PAH/TAH ROZ will fit within the size of a 5 x 5 minute subdivided grid box. SOF operations ROZs, like ATACMS, also may only require a 5 x 5 minute surface area (Figure II-4B). The advantage of subdividing a grid box reference area (and establishing FSCMs and/or ACMs in these smaller areas) is that unused space is made available for other adjacent operations. It allows components to use one or more subdivisions of a standard grid box, in any combination, as necessary. Subdivision allows the employment of several different weapon systems on multiple targets within a standard grid box. However, subdivision should be used as necessary, and care should be exercised not to overly complicate the grid box system, as simplicity is key to its success.

• Vertical Dimensions. As with horizontal dimensions, the vertical dimensions of a grid box are dependent on planned weapon system employment tactics. However, they are also very dependent on the control and coordinating measures used during the attack. Consequently, the optimum *vertical* dimensions of a baseline grid box are difficult to standardize. Vertical

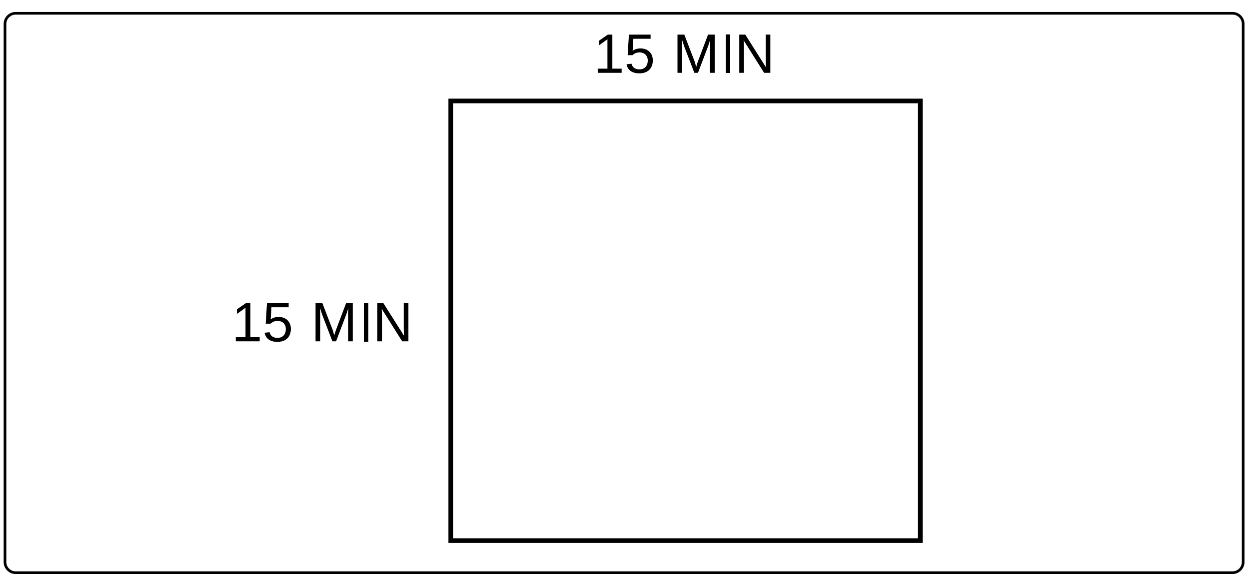

Figure II-3. Standard Baseline Grid Box

dimensions are much more situationally dependent. Generally, FSCMs (in this case, ACAs) and/or ACMs are used to facilitate the planned weapon system employment tactic. Typical measures include establishing ACAs (formal and informal), RFAs, HIDACZ, MRRs, and ROAs/ROZs. In doing so, the JFC and component commanders should give careful consideration to the maximum vertical dimensions of the measure established in the grid box so as not to unnecessarily restrict or inhibit other affected component operations.

• • Indirect fire weapon systems require vertical dimensions to accommodate maximum ordnance altitudes along the gun-target line or route of flight of the missile. In the case of ATACMS, the altitude along the missile's flight path must be deconflicted. Appropriately subdivided grid box sectors may be used to identify established PAHs and TAHs (normally as ROAs/ROZs) for ATACMS launch positions and target areas.

• • Aircraft require grid box vertical dimensions to accommodate planned minimum and maximum altitudes for effective employment (normally an ACA).

• • The vertical dimensions of any measure established in a grid box should be carefully planned so as to not inhibit overflight of weapon systems en route to other targets in other grid boxes. Occasionally, adjacent grid boxes may be identified for attacks by different components. In such cases, FSCMs and/or ACMs must be properly established to adequately deconflict neighboring operations. These situations require the establishment

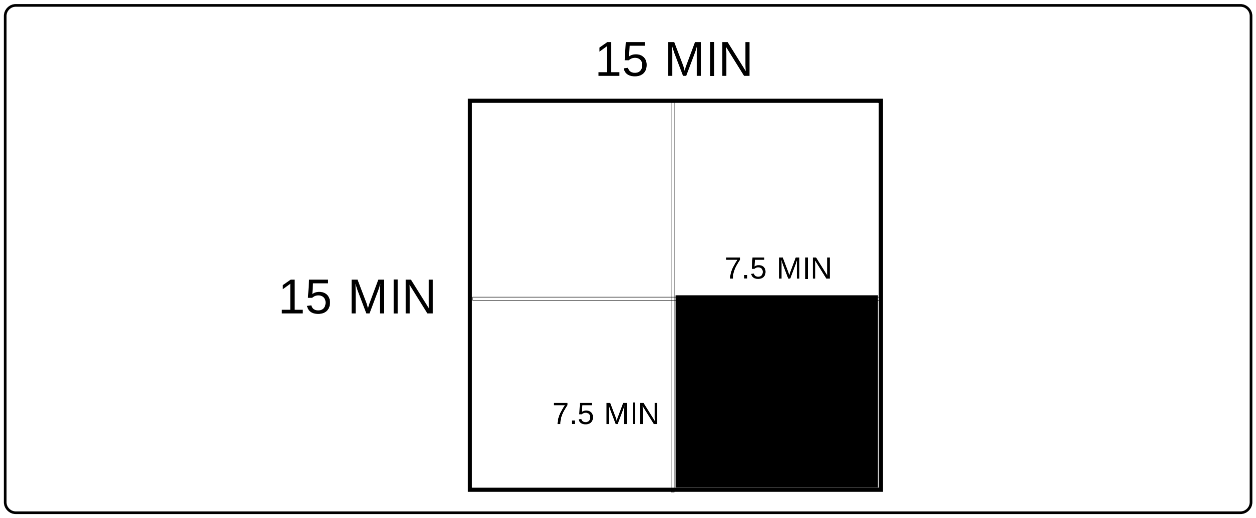

Figure II-4A. Four Quadrant Subdivision Option

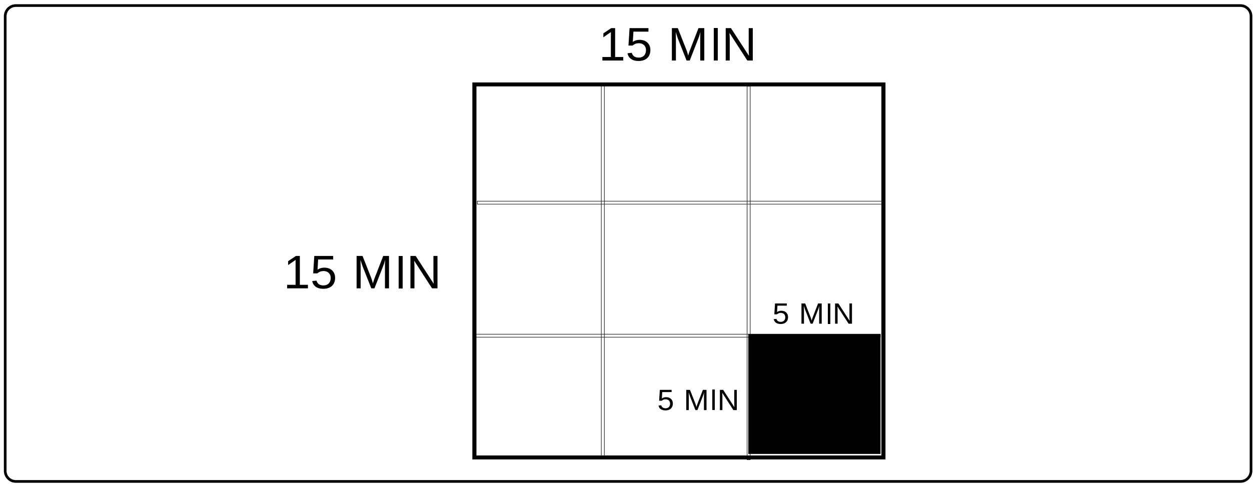

Figure II-4B. Nine Sector Subdivision Option

of appropriate measures to deconflict weapon system flight paths (aircraft, missile, or projectile) en route to geographically separated grid boxes.

• • Aircraft have the flexibility to move around most vertical restrictions (such as an ATACMS TAH or ROZ) en route to a target area or grid box. MRRs protect such aircraft movements. Likewise, some TLAMs and CALCMs can be planned to maneuver within MRR restrictions.

• • ATACMS engagements generally do not have the flexibility to maneuver around ACAs. Therefore, careful consideration should be exercised before establishing vertical restrictions in the path of expected ATACMS routes of flight.

(c) Theater Layout. The grid box reference systems may be used anywhere in the operational area. Placement of the grid system is situationally dependent on IPB and the location of known (planned and unplanned immediate) surface TCTs. In other words, grid boxes should be established in potential surface TCT areas where rapid component to component coordination and deconfliction will be required. The grid systems may be small and limited in size, covering separate areas, or the JFC may elect to group grid boxes together to form a "patchwork quilt" or "lattice" covering the entire AOR/JOA. The second option allows maximum flexibility to rapidly coordinate and deconflict attacks/airborne surveillance operations against both known *and* unknown (immediate unanticipated) surface TCTs anywhere they are located. If the JFC so desires, grid boxes may be used to extend from the rear areas of the AO, across the FLOT, through the area between the FLOT and FSCL, and beyond the FSCL (to include areas past the AO boundary [Figure II-5]).

(d) Labeling and Identification. Grid boxes should be labeled with a simple, common, universal identifier recognizable by each component and their associated C2 and attack assets. Coordination and deconfliction of attacks is simplified by procedurally communicating grid boxes labeled by alphanumeric identifiers rather than complicated and detailed series of LAT/LONG coordinates. A simple alphanumeric system allows for a common "language" and perspective when components communicate in time-critical situations (example: *Grid Box D-8* [Figure II-6]).

• Grid boxes subdivided into four quadrants may be identified by their

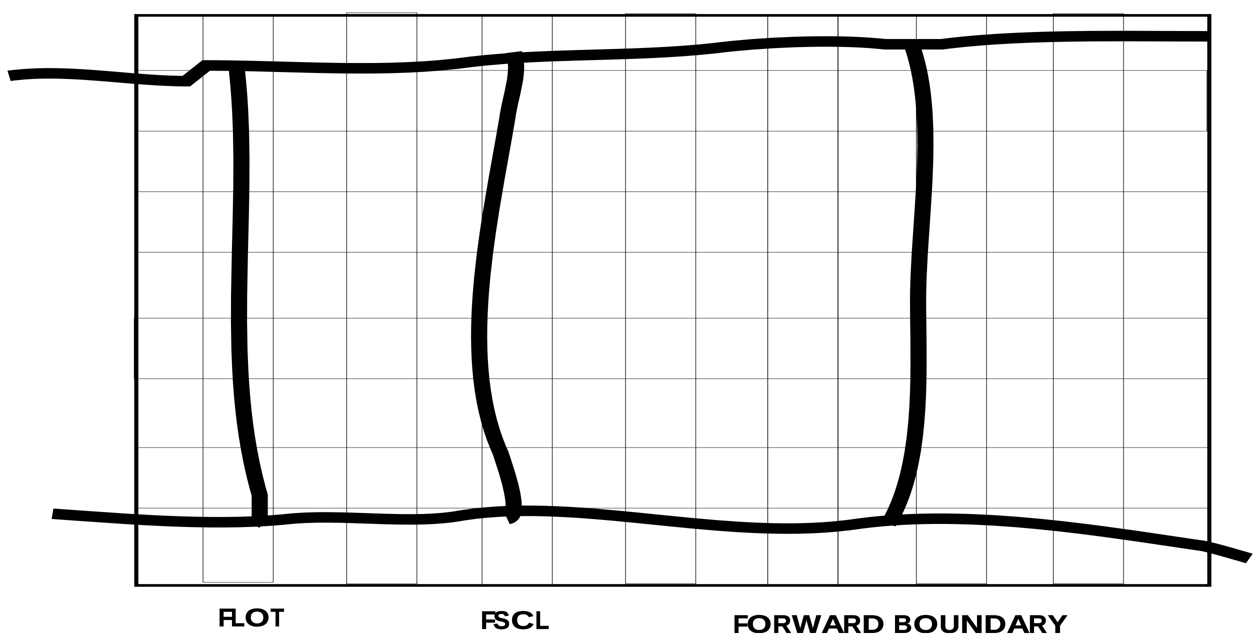

Figure II-5. Example Theater Layout

respective cardinal position—northwest, northeast, southeast, and southwest (example: *Grid Box D-8, northwest quadrant* or *D-8, northwest* [Figure II-7]).

• Grid boxes subdivided into nine sectors may be identified by respective cardinal positions as well (example: *Grid Box D-8, north sector* or *D-8, north* [Figure II-8]).

• Refinement of a specific target location within a grid box quadrant may be accomplished by adding the actual minutes of latitude and longitude (example: *Grid Box D-8, northwest quadrant, 40 min x 20 min* or for brevity: *D-8, northwest, 40 min x 20* min [Figure II-9]) or transmit detailed coordinates (example: *Grid Box D-8, north xxxx.xx east xxxx.xx*). (***Note: Transmitting LAT/LONG coordinates over unsecured nets may compromise the location of planned attacks.***)

• Grid boxes may be assigned TADIL-J/A/B numbers in addition to their alphanumeric designation for ease of dissemination across specific operational area data links.

• Grid box reference systems have a communications security (COMSEC) advantage. Unlike stand alone LAT/LONG or UTM coordinates, grid box alphanumerics may be communicated over unsecured channels (voice or data) without risk of compromise as long as the actual coordinates of the areas are not associated. (Initial grid reference systems and their associated geographic coordinates should be published in classified orders and instructions, to include the ACP.) Also, grid box alphanumeric coding should be regularly changed to ensure enemy forces have not deduced and correlated unsecure grid box identification transmissions with executed attacks (that is, the ability of the enemy to correlate areas recently attacked by friendly forces with intercepted grid box transmissions).

(e) Grid Box Reference System Development. The JFC should appoint a component commander (normally the JFACC, as the airspace control authority) to develop the grid box reference system for the entire AOR/JOA. Similar to land/amphibious force commander establishment of the FSCL, the airspace control authority should develop the grid box reference system (although it is not a FSCM in and of itself) in consultation with superior, subordinate, supporting, and affected commanders. Guidance from the JFC and inputs from other component commanders are critical to ensuring the reference system fits the needs of the joint force and more

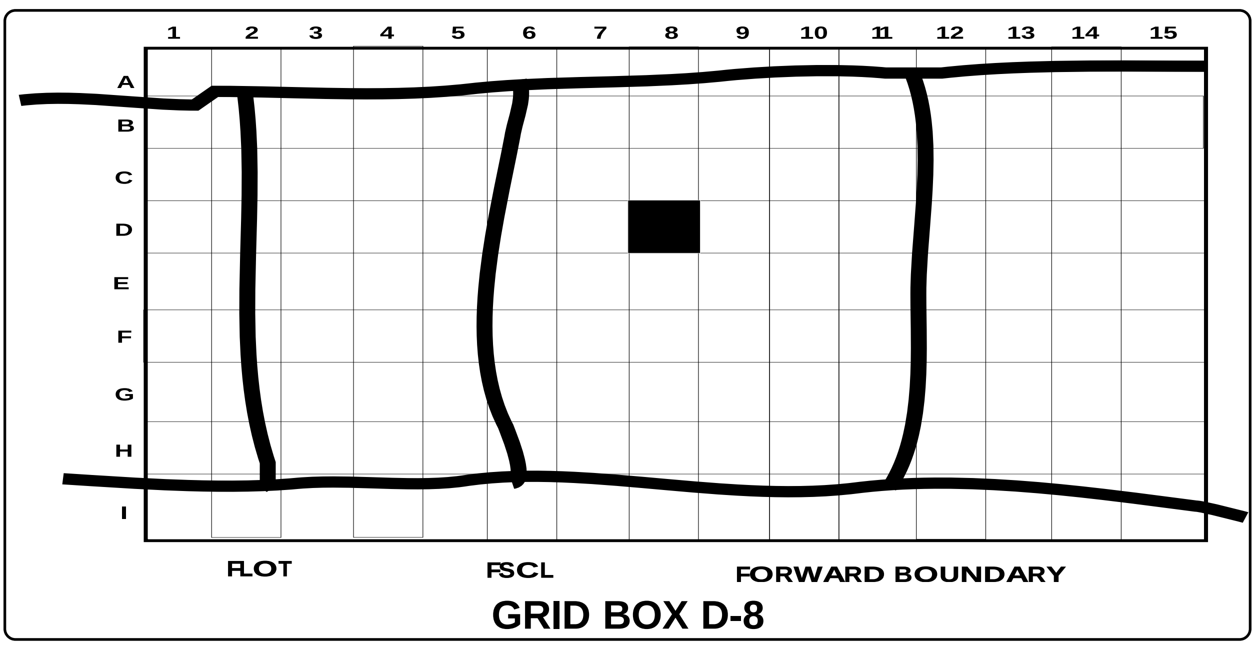

Figure II-6. Grid Box Labeling and Identification

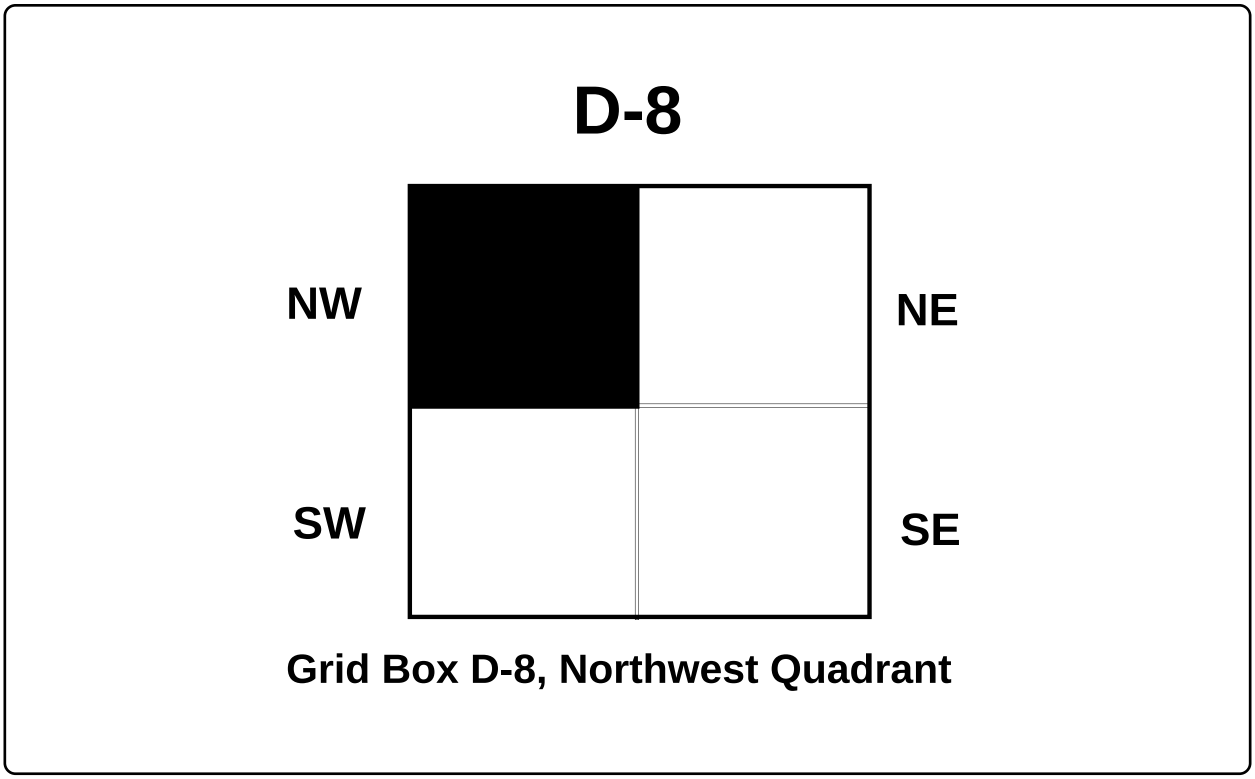

Figure II-7. Grid Box Subdivision Four Quadrant

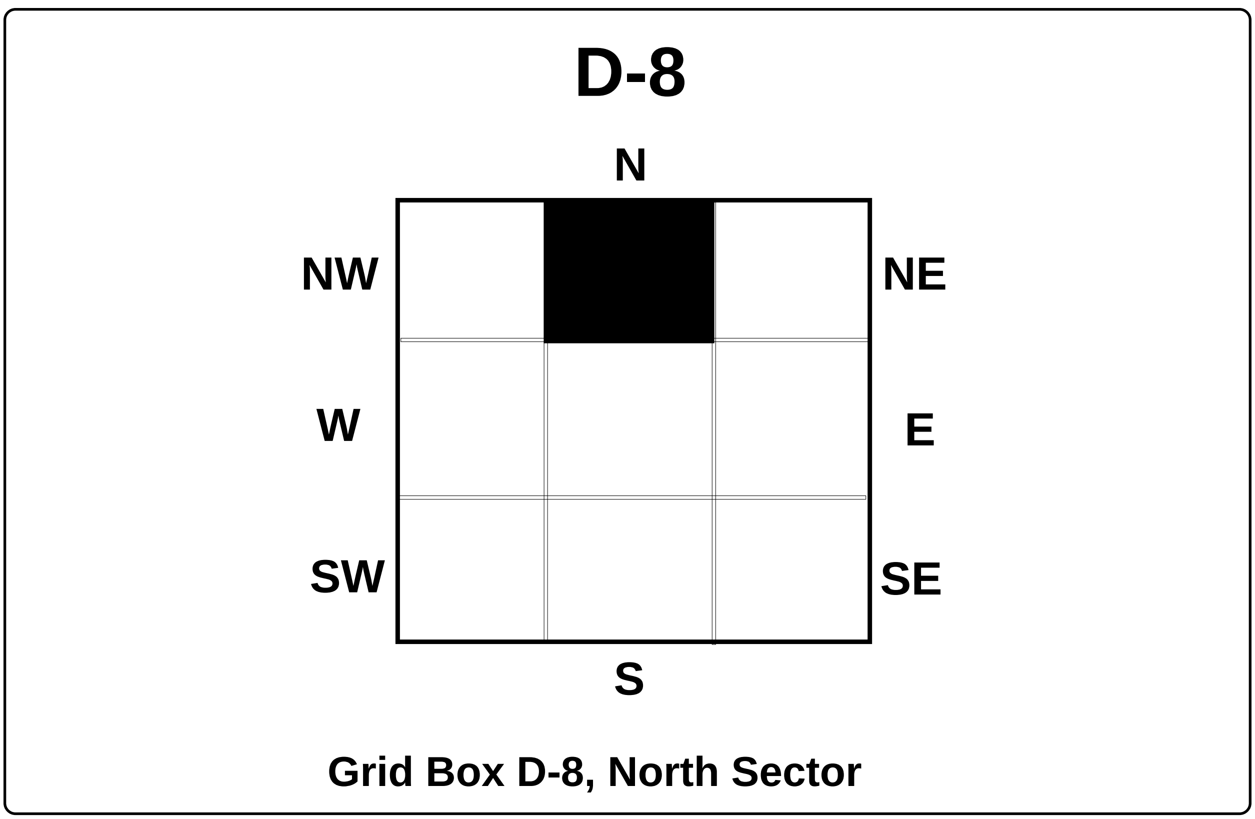

Figure II-8. Grid Box Subdivision Nine Sector

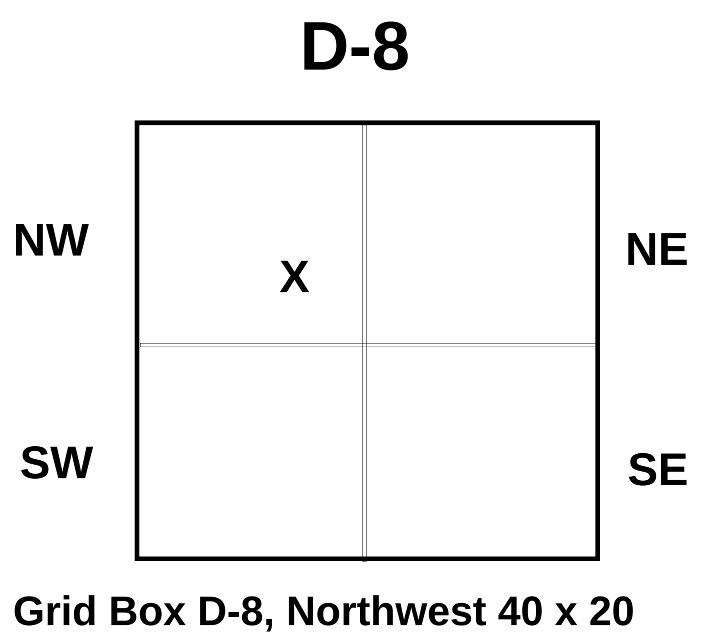

Figure II-9. Grid Box Target Refinement

importantly accepted as a mutual tool. Once developed, the JFC should evaluate the system for its potential to expedite coordination, deconfliction, and synchronization within the applicable operational area. Once approved, the reference system is passed to each component and their associated C2 and attack assets.

• Grid box reference systems should be incorporated into operational graphics and overlays of component C2 systems. With the Advanced Field Artillery Tactical Data System (AFATDS) (Appendix B), the land or amphibious component can enter the reference system as an operational graphic in the same manner as boundaries or phase lines are entered. Most importantly, AFATDS accepts input of FSCMs and ACMs. With the joint approved Contingency Theater Automated Planning System (CTAPS), the JFACC can similarly enter the reference system in the theater integrated situation display (TISD). Also, the JFACC should ensure the information is entered into AETACS databases, as well as published in the ACP.

(f) No Assigned Establishing Authority. It is important to recognize that grid boxes are a **reference system and not control and coordinating measures**. As such, there is no "establishing authority" for any specific grid box, as they are not "established" or "activated" as control and coordinating measures. (***Note: As stated in subparagraph (e), the JFC appoints a single component commander only to develop the grid box reference system for the AOR/JOA.***) The usefulness of this system is that it allows components to establish appropriate control and coordination measures, as authorized, that can be mutually coordinated, deconflicted, and synchronized via a simple, common, mutually understood, and agreed upon reference system.

(g) Grid Box Reference System Management. Once developed and approved, each component uses the common grid box reference system to rapidly coordinate, deconflict, and synchronize attack operations with other components. In a time-critical situations, components use grid boxes to reference where they plan to establish FSCMs and/or ACMs and execute attack operations. Unilateral activation of FSCMs and/or ACMS within grid box areas without coordinating and deconflicting with other components severely risks the potential for duplication of effort and fratricide.

(h) Separate Grid Box Systems. In some cases, the JFC may elect to establish separate grid box systems. Reasons for doing this rely heavily on geographic separation of the battlespace (that is, two distinct, geographically separate AOs/AOAs) where two distinct grid box reference systems are in place [Figure II-10]).

(i) Grid Box Status. Grid boxes identify ongoing attack operations and established FSCMs and/or ACMs. Under normal circumstances, the airspace and/or surface areas identified by a grid box are under prior established control and coordinating measures and applicable supported/supporting commander relationships apply. However, once a grid box is used to identify appropriate airspace and/or surface areas, operations within the grid box are temporarily restricted in accordance with the established FSCMs and/or ACMs within the area.

(j) Grid Box Execution. Once a component acquires a surface TCT, they identify the grid box (along with the specified grid box quadrant). Next, the component transmits their intent to fire on or attack the surface TCT, along with their intent to establish an appropriate FSCM and/or ACM, to the other components. After detailed coordination with component liaison/coordination elements, the component establishes the desired control measure. Coordination will require verification that there are no other airspace/surface area conflicts in the intended grid box. Depending on the level of situational awareness and access to sensors (such as AWACS, control and reporting center [CRC], or Joint STARS), this coordination could take several minutes. Components are responsible for transmitting grid box areas with FSCMs/ACMs to affected units via C2 agencies and systems. Required information includes grid box identification, type of attack, and established FSCMs and/or ACMs (to include appropriate applicable times). Once the attack is complete, the originating component informs the other components that the FSCMs and/or ACMs in the grid box are deactivated.

• Depending on the intensity of the active surface TCT threat and the level of component attack execution, it is possible to have multiple component attacks occurring throughout the grid box reference area at the

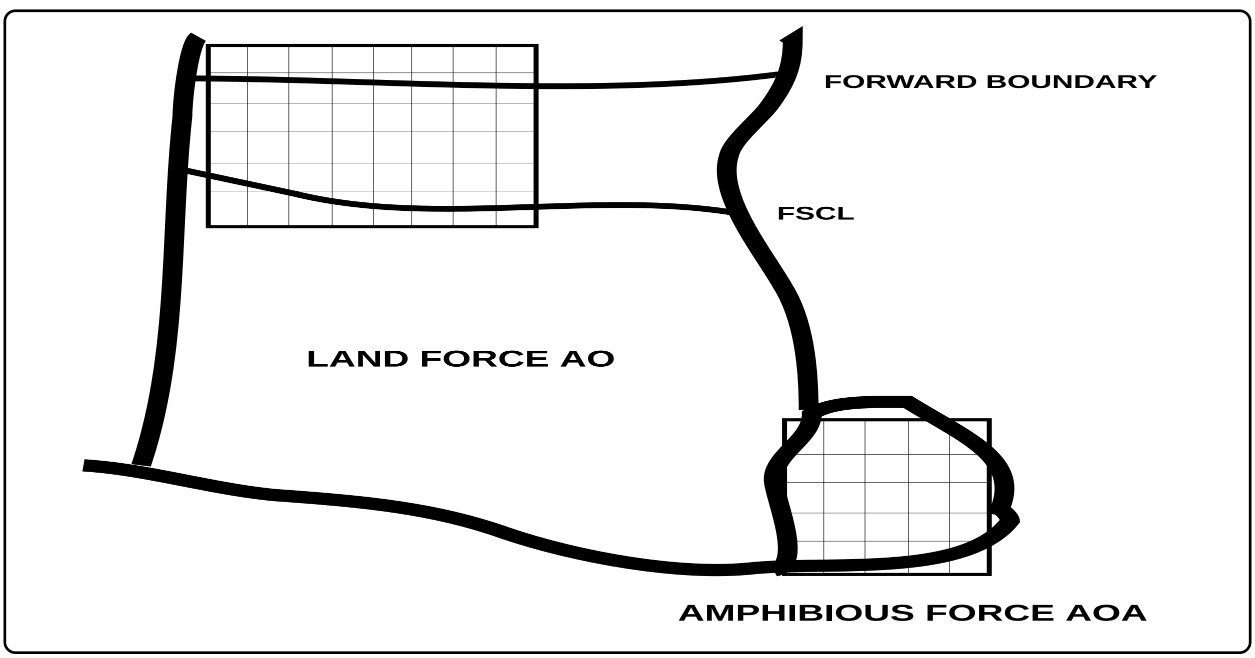

Figure II-10. Separate Grid Box Systems

same time. Carefully managed, numerous grid boxes can be used simultaneously with various FSCMs and/or ACMs in effect. The complexity of coordinating, deconflicting, and synchronizing multiple component operations against a significant surface TCT threat is simplified through the use of this flexible reference system that can provide immediate situational awareness to all players. The reference system further enhances a common joint force perspective when it is translated onto real-time command and control data systems, such as CTAPS, AFATDS, and ADOCS (Figure II-11).

• The JFACC can transmit grid box information to fighters, sectors, and wing operations centers (WOCs) via AETACs platforms (such as AWACS, ABCCC, Joint STARS, or DASC-A) or ground coordination agencies (such as the ASOC, DASC, CRC, and control and reporting element [CRE]). CTAPS may also be used to communicate this information via the TISD.

• The land and amphibious force commander can transmit similar information via the FSE, FSCC, force fires coordination center (FFCC), deep operations coordination cell (DOCC), or FPTOC. The AFATDS and Army Automated Deep Operations Coordination System (ADOCS) (Appendix C) serve as rapid means to communicate this information via established tactical fire direction system nets and local area network (LAN) systems.

• The naval component commander or JFMCC, if designated, can transmit this information via the supporting arms coordination center (SACC), tactical air command (or control) center (TACC), E-2C and DASC-A platforms, and AEGIS cruisers.

(k) Blanket Grid Box Use. There may be instances where it is prudent to use grid boxes to identify blanket FSCMs and/or ACMs in advance of surface TCT acquisition. Grid boxes can be assigned to specific weapon systems for immediate attack once the surface TCT is acquired within the grid box. For example, a series of grid boxes may be assigned directly to fighter aircraft for interdiction purposes. Similarly, grid boxes may be assigned to a FAC-A. Likewise,

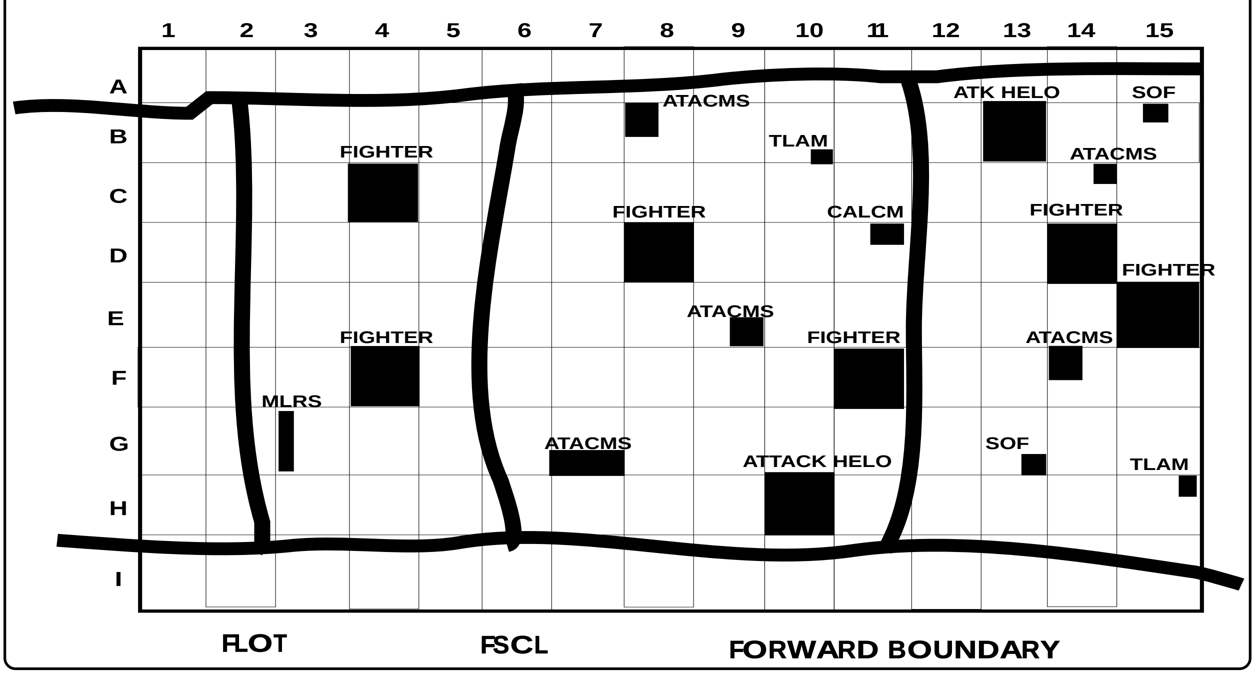

Figure II-11. Multiple Component Attack Operations Using a Single Grid Box Reference System

grid boxes may also be assigned to an ATACMS battery for preplanned fire missions. Once the target is acquired, coordination is minimized and the mission can be executed on a NRT basis.

(l) Grid Box Examples:

•**Example #1**. Joint STARS acquires a surface TCT and transmits its location to the FSE/FSCC GSM, battlefield coordination detachment (BCD) GSM, and JAOC. The BCD and JAOC mutually decide to assign fighter assets (holding on CAP stations) to attack the TCT.

• •The BCD requests the FSE to terminate all indirect surface to surface fires (if any) into the intended grid box.

• •The JAOC, acting as the agent for the airspace control authority, and as requested by the BCD (if appropriate), establishes an ACA in the intended grid box. The JAOC also determines which MRRs (if necessary) should be used en route, as well as determines if any other conflicting grid boxes are active.

• •The BCD transmits the ACA and MRR information via AFATDS to the FSE for deconfliction.

• •The JAOC directs the fighter controlling agency (normally AWACS, ABCCC, or the DASC-A) to execute the fighters, transmitting all appropriate targeting and deconfliction information using the grid box system as a common reference. Specific targeting information (such as detailed coordinates) is passed once the grid box focuses the area of intended attack (that is, the "big to small" concept).

• •The fighters depart the CAP and follow MRRs (if any) en route to the assigned grid box, maintaining situational awareness and not entering any other FSCM/ ACM in any other grid box. Upon arrival at the assigned grid box and established ACA, the attack begins.

• •Once the fighters have completed their attacks and the target is destroyed, the AWACS/ABCCC/DASC-A advises the JAOC it is ready to deactivate the ACA in the grid box and associated MRRs.

• •Once fighters are clear, the JAOC, in coordination with the BCD, deactivates the ACA in the grid box and transmits the information to all components. The BCD transmits this information via AFATDS.

• **Example #2**. The land component has acquired a target through national assets. The FSE identifies which grid box the surface TCT is located in and plans for an ATACMS attack.

• •The FSE transmits grid box information to its BCD, advising them which grid box they intend to attack.

• •The BCD coordinates this information with the JAOC, and they mutually identify the intended grid box.

• •The BCD, in coordination with the land component commander, establishes an RFA over the TAH. The JAOC, as agent for the airspace control authority and in coordination with the BCD, similarly establishes a ROZ over the ATACMS launcher (PAH) and ROZ over the surface TCT (TAH) in the intended grid box.

• •The JAOC and the BCD determine if any other FSCMs/ACMs are active that might conflict with the ATACMS flight path en route from the PAH (ROZ) to the TAH (ROZ).

• •The JAOC advises all affected aircraft of the pending ATACMS fire mission via AWACS, ABCCC, or DASC-A (as appropriate). The grid box reference system is used to rapidly identify the PAH (ROZ) and TAH (ROZ) locations. The grid box system is particularly useful for passing these locations to aircrews of fixed- and rotary-wing aircraft, since they do not need to plot coordinates to determine if they are in potential conflict. (During mission planning, the aircrew can plot the grid boxes/quadrants of their planned flight route, and when a warning is transmitted, they will immediately be able to determine whether their route of flight is in potential conflict. Likewise, for immediate, unplanned airborne diverts, the grid box system is a useful tool for quick reference, coordination, and deconfliction of flight paths from other operations.)

• • The ATACMS mission fires.

• • Once the mission is complete, the FSE advises the BCD it is ready to deactivate the FSCM in the grid box. The JAOC and BCD deactivate the ROZs and RFA (respectively).

(2) "Bullseye" Reference System. The bullseye reference system is similar to the grid box reference system in that it can be used to provide components with a common perspective of the battlespace and allow for common identification of mutually accessible attack areas. In addition, it can be used to identify the center point for the establishment of an appropriate FSCM/ACM. The bullseye reference system is normally used during counterair engagements for situational awareness on targeted and untargeted airborne threats. However, it has application in attacks against surface TCTs. The bullseye concept is similar to the US Army Terrain Index Reference System (TIRS) as well as the target reference point (TRP) concept, that are used to quickly identify a target off of a known geographic point.

(a) Bullseye Design. Bullseyes may be established throughout the AO/AOA by selecting geographic points of reference and encoding them with code words or alphanumerics. If multiple bullseyes are required, each bullseye can be labeled with a specific code word. For example, three bullseyes can be designated as Bullseye *Alpha*, *Bravo*, and *Charlie* (Figure II-12). These geographic points should be incorporated into operational graphics and overlays of component C2 systems, such as AFATDS, CTAPS, AETACS databases, and the ACP.

(b) Bullseye Development. Any component can develop bullseyes. To be effective during cross-component coordination and deconfliction, these bullseyes must be communicated to other components, preferably in advance of combat operations.

(c) Bullseye Execution. Any surface TCT or attack can be referenced by its bearing and distance from a selected bullseye. Bearings should be described reference magnetic north and distance in nautical miles. Selected targets or attacks can then be rapidly coordinated and deconflicted using the bullseye as a common reference.

(d) Bullseye Errors. The utility of a bullseye system is greatly hampered when targets are identified a significant distance from the specified bullseye point. As distance from the point increases, the larger the surface area per degree occurs, and consequently, the higher probability of error. The formula for error is as follows:

One degree of azimuth error = one NM of horizontal distance error at a range of 60 NM ("60 to 1" rule)

Therefore, a one degree of azimuth error at a range of 12 NM from a selected bullseye is equivalent to a **0.2 NM** location error. However, a one degree of azimuth error at a range of 120 NM from a selected bullseye results in a significantly greater location error. In this case, it equates to **2 NM**. Essentially, the potential for error increases in direct proportion to any increase in range. ***If the range increases by a factor of 10, any degree of azimuth error will likewise increase the location error by a factor of 10***. Therefore, it is best to use the bullseye technique in smaller areas/AOs/AOAs.

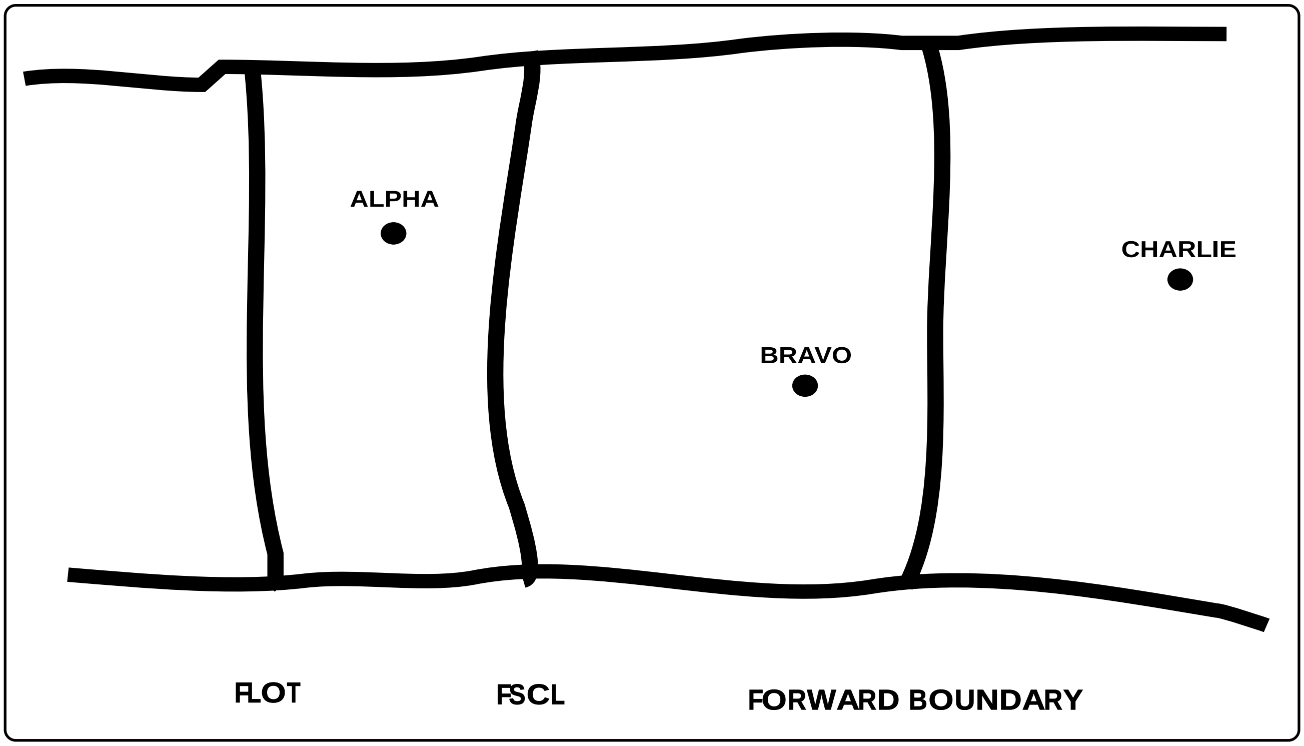

Figure II-12. Bullseye Reference System

(e) Bullseye Examples. The following are examples of component descriptions of surface TCT targets while using a bullseye reference system. Provided that each component understands the common bullseye reference points, coordination and deconfliction can occur. However, this process is much more fluid and inexact than the grid box procedure.

• **Example #1**. A surface TCT located 20 NM south of bullseye *alpha* should be referred to as *Target, Bullseye Alpha, 180 degrees for 20 NM* (Figure II-13). Fighter aircraft are then assigned to search for and attack the surface TCT. Appropriate FSCMs and/or ACMs can be established as in the grid box procedure.

• **Example #2**. ATACMS attacks intended for a target northwest of bullseye *Charlie* should be coordinated and deconflicted with other components by communicating *ATACMS attack, Bullseye Charlie, 335 degrees for 55 NM* (Figure II-14). (***Note: Actual targeting data [that is, specific target coordinates] is much more detailed. This information does not have to be transmitted for area deconfliction.***) Similarly, ATACMS PAH, route of flight, and TAH can be cleared via the BCD and the JAOC. Appropriate FSCMs and/or ACMs can be established as before (RFAs and ROZs).

• **Example #3**. In extreme cases, bullseye calls can be transmitted on GUARD frequencies (UHF 243.0 and VHF 122.5) to warn aircraft of impending ATACMS, CALCM, or TLAM attacks in their area. This should only be used as a last resort when prior coordination and deconfliction could not have been accomplished.

g. **Weapon Systems Procedures**. Various weapon systems carry out attacks against surface TCTs. Specific procedures oriented toward this mission enhance overall success. This section describes some of the primary weapon systems procedures that may be used against surface TCTs: ATACMS, fighter/attack aircraft, AC-130s, and attack helicopters.

(1) ATACMS Procedures. The land or amphibious force commander may choose to use the ATACMS when assigned the responsibility to engage surface TCTs as a specific target set.

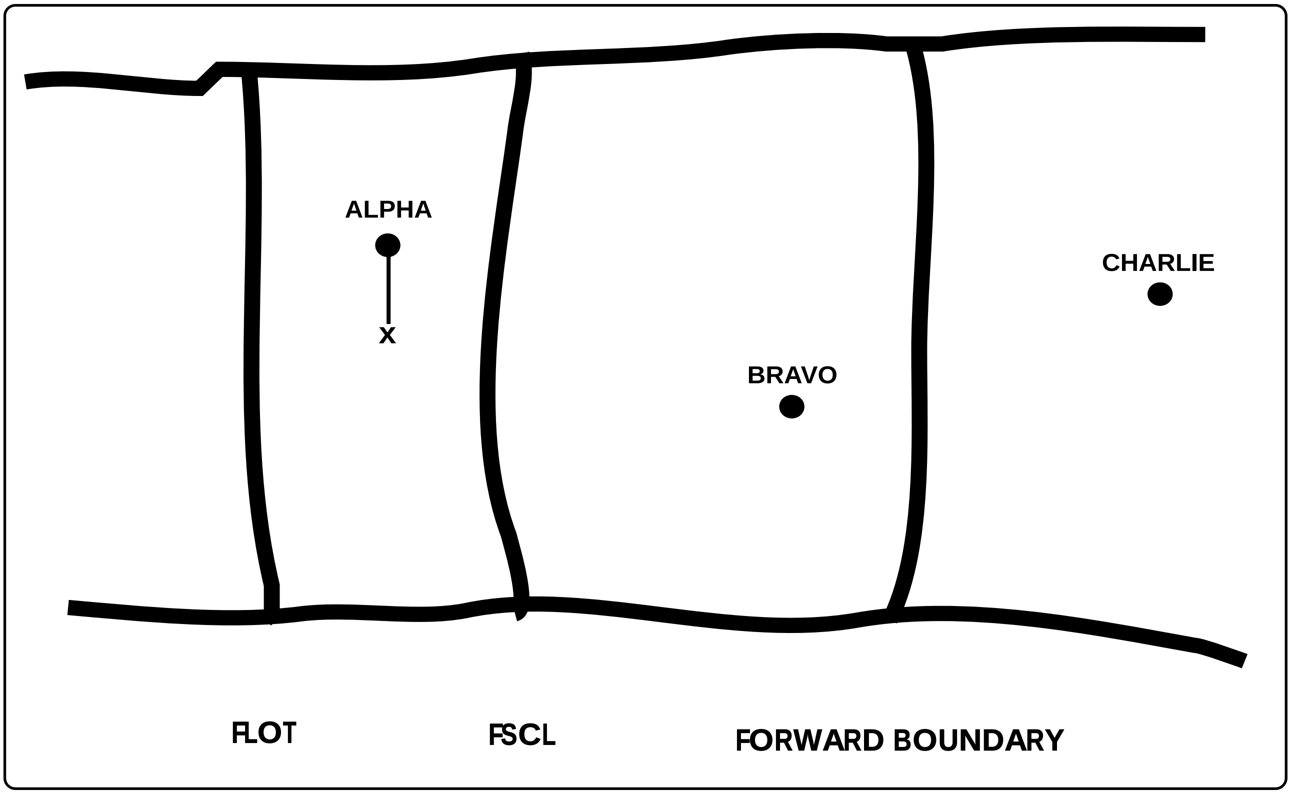

Figure II-13. Bullseye Example #1

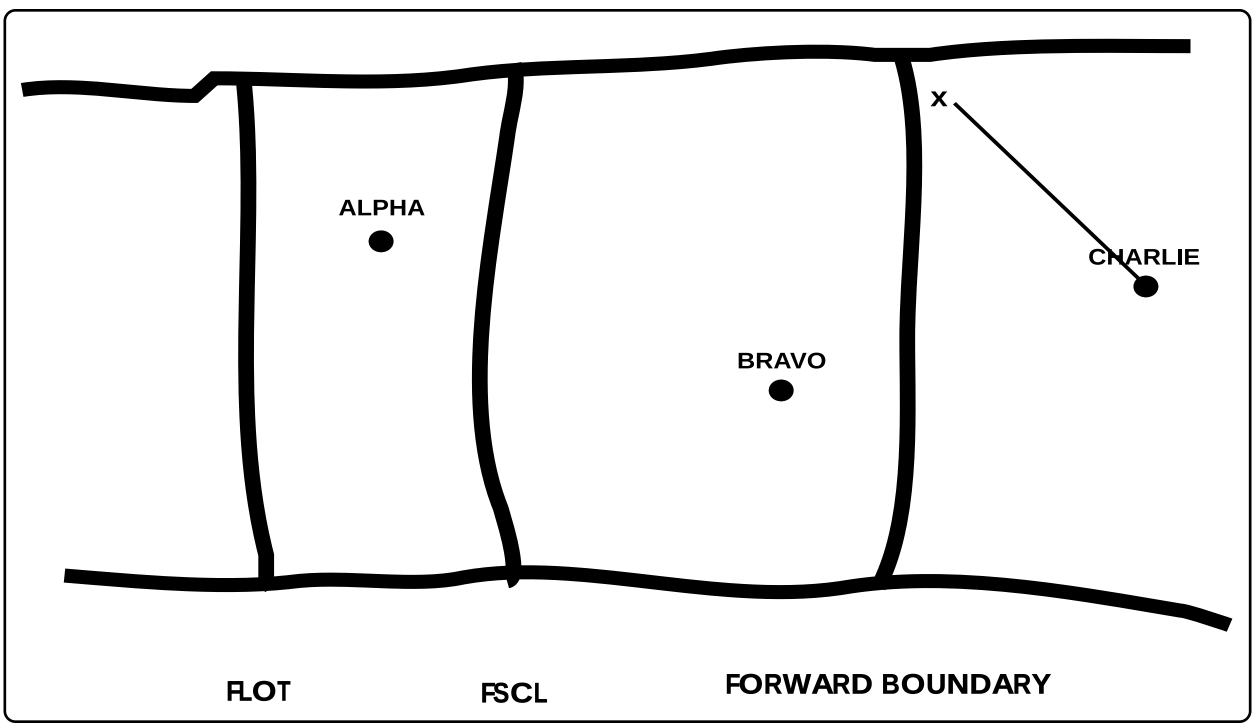

Figure II-14. Bullseye Example #2

(a) Tasking. Using the AGM, the land or amphibious force commander directs the desired number of ATACMS launchers (battery, battalion, or brigade) to maintain a **hot** (ready to fire) posture. Some ATACMSs will normally be controlled by corps artillery in support of the deep battle.

(b) Identification of Anticipated Engagement Areas. The AGM sets forth a priority matrix listing HPTs, normally surface TCTs. Anticipated engagement areas are defined as named areas of interest (NAIs) which focus surveillance efforts for collection assets. These areas are also defined as target areas of interest (TAIs) and assigned to ATACMSs with specific trigger events. NAIs, TAIs, and trigger events are all listed in the DST. TAIs should be forwarded to other component commanders, particularly the JFACC, for advance deconfliction planning.

(c) Specified Engagement Windows. The land or amphibious force commander may be able to set forth planned engagement windows for these potential engagement areas tied to the AGM, commander's intent, IPB, and availability of intelligence sensors. These windows would not preclude aircraft from operating in the area, but it would alert them to the possibility that the zone could go **hot** with very little advance notice. AETACS platforms, as well as Joint STARS and CRC/CRE/ASOC/direct air support center (DASC) agencies should also be advised of the time windows.

(d) Firing Positions. For responsiveness, PAHs may be computed and precoordinated using anticipated target locations and engagement areas. PAHs for planned ATACMS missions should be published, whenever possible, in the airspace control order (ACO). Additional PAHs (ROZs) may be computed and designated on the ACO for activation on an "as needed" basis for "on-call" and immediate fire missions. This will facilitate ATACMS battery flexibility to employ "shoot and scoot" tactics. However, restricting all ATACMS PAHs (ROZs) to be published on the ACO for on-call and immediate fire missions may not always be feasible, as restricting an ATACMS firing unit to a position designated by the ACO will increase their vulnerability and reduce their responsiveness to the flow of the battle. With fire missions that cannot be anticipated, immediate PAHs (ROZs) should be coordinated and deconflicted via the grid box technique described earlier.

• The ATACMS fire direction system computes the PAH (ROZ) based on the size and deployment of the ATACMS platoon, desired exit altitude, and missile trajectory. This information is transmitted to appropriate agencies (such as the FSE and BCD) via AFATDS.

• Dimensions vary from 3 kilometer (km) (1.5 NM) to 10 km (5.5 NM) radius from platoon center. Typical altitude of the PAH (ROZ) can be as low as 5000 meters (16,500 feet above ground level [AGL]) to 15,000 meters (49,200 feet AGL).[29] Fire direction system defaults are 3000 meters radius (1.5 NM) and 10,000 meters (32,800 feet AGL). Coordination for these PAHs (ROZs) occurs through the BCD and the A2C2 element to the JAOC.

• Although the PAH (ROZ) is measured horizontally by a radius from platoon center, the fire direction computer defines the PAH (ROZ), using trajectory information for the mission, as four-corner coordinates and an altitude. The PAH (ROZ) contains the missile trajectory from launch point to the desired altitude. The sides of the PAH (ROZ) correspond to the location of the missile, projected on the ground, when it achieves the desired altitude (Figure II-15).

• The total time an ATACMS missile transits the PAH (ROZ), from launch to desired altitude, is approximately 15 seconds.

(e) ATACMS En Route Altitudes. The ATACMS missile is above the PAH (ROZ) altitude en route to the TAH (ROZ). Desired exit altitude and missile trajectory (key elements for computing the PAH [ROZ]) are determined by the FDC based on a number of factors, primarily range to the specific surface TCT. However, the FDC must evaluate the desired exit altitude and missile trajectory to ensure they result in a computed flight path that will not conflict with any established FSCMs and/or ACMs, specifically those established for fighter and attack helicopter operations.

• The FDC should consult the FSE/FSCC (in contact with the BCD) to determine the requirement (if any) for flight path deconfliction.

• There should be no requirement to clear the flight path of the missile unless airspace above the PAH/TAH (ROZ) altitudes will be used. The high altitude flight path characteristics of an ATACMS missile place it in a different category than classic indirect fire projectiles. By comparison, the missile's flight path is similar to that of a high-altitude, fixed-wing aircraft, with a maximum altitude of greater than 30 km (approximately 98,000 feet AGL). Total ATACMS missile time of flight between the PAH (ROZ) and TAH (ROZ) is 3-6 minutes.

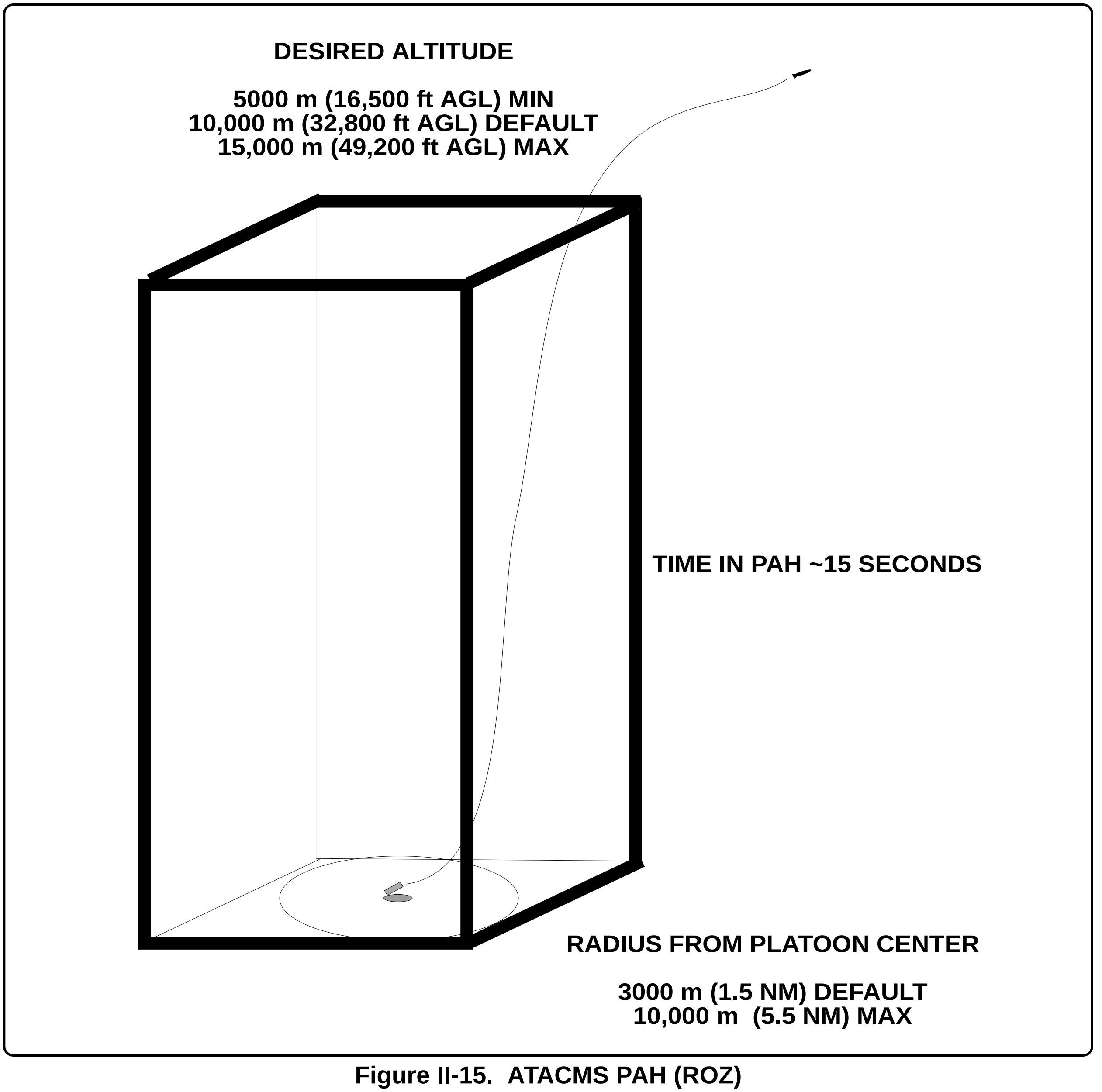

Figure II-15. ATACMS PAH (ROZ)

• If necessary, this flight path may be deconflicted by establishing temporary coordinating altitudes for any given profile or series of profiles. Grid box references and coordinated high altitude ACAs along the route of flight are one such method to accomplish deconfliction. Typically, the only reason this would be necessary would be to deconflict the missile's flight path from high-altitude surveillance aircraft, such as a U-2.

(f) Target Area Deconfliction. For responsiveness, TAHs (ROZs), like PAHs (ROZs) should be computed and precoordinated using anticipated target locations and engagement areas. However, since surface TCT location is not precisely known until shortly before launch, most ATACMS TAHs (ROZs) may not be published in the ACO. Consequently, deconfliction of the impact area occurs on very short notice. Use of grid box or bullseye reference system procedures are valid techniques to deconflict attacks in such situations. Dimensions of ATACMS TAHs (ROZs) are computed similarly to PAHs (ROZs).

• The ATACMS fire direction system computes the TAH (ROZ) based on the size and deployment of the ATACMS platoon, desired reentry altitude, and missile trajectory. As with the PAH (ROZ), this information is transmitted via AFATDS.

• Dimensions vary from 1000 meters (.5 NM) to 10,000 meters (5.5 NM) radius from missile canister function/impact center. Typical altitude of the TAH (ROZ) can be as low as 5000 meters (16,500 feet above ground level [AGL]) to 15,000 meters (49,200 feet AGL).[30] Fire direction system defaults are 1000 meters radius (.5 NM) and 10,000 meters (32,800 feet AGL). As with PAH (ROZs), coordination for TAHs (ROZs) occurs through the BCD and the A2C2 element to the JAOC.

• The TAH (ROZ) contains the missile trajectory from reentry point to missile canister function altitude/impact center. It is measured horizontally by a radius from missile canister function/impact center. However, the fire direction computer defines the TAH (ROZ)—using trajectory information for the mission—as four-corner coordinates and an altitude. The sides of the TAH (ROZ) correspond to the location of the missile, projected on the ground, when it enters the TAH (ROZ) (Figure II-16).

• The total time an ATACMS missile transits the TAH (ROZ), from entry to function/impact time, is approximately 35 seconds.

(g) Joint STARS Support. Joint STARS supports ATACMS through direct targeting information via deployed GSMs. See *MTTP for Joint STARS* for more information.

(2) Fighter/Attack Aircraft Procedures. Fighter/attack aircraft can rapidly respond to surface TCTs provided they are airborne and in communication with the C2 platform and/or agencies that receive NRT targeting information. This targeting information can be received directly (via voice or data link) from airborne surveillance platforms (such as a direct strike direction net with Joint STARS) or C2 platforms (such as an indirect strike direction net with an AWACS/ABCCC/DASC-A receiving off-board targeting information).

(a) Surface TCT Combat Air Patrol Procedures. Surface TCT CAP points are special use airspace ACMs that define orbit/holding areas for fighter/attack aircraft assigned to surface TCT attack missions. Fighter/attack aircraft are most responsive when airborne and holding in these preestablished areas. This technique should normally be used in specific conditions and times when surface TCTs are known to exist and air employment is a critical factor for accomplishment of JFC objectives. These surface TCT CAP points should be located close to expected surface TCT engagement areas so as to minimize en route time (***Note: surface TCT CAP points should not expose***

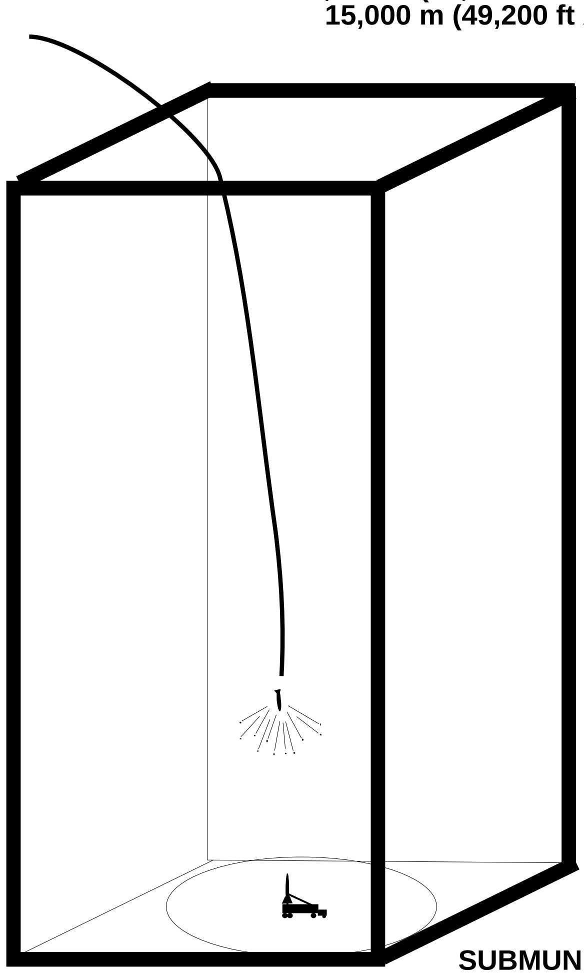

Figure II-16. ATACMS TAH (ROZ)

holding fighters to surface threats nor should they be located in areas requiring possible deconfliction with other weapon systems). Surface TCT CAP points should not be over grid boxes or planned ATACMS PAH ROZs. Fighter/attack aircraft should be placed on ground alert to backfill surface TCT CAPs once the original aircraft have been committed against surface TCTs. Aircraft on ground alert may be used for direct surface TCT tasking, yet their response time will be longer.

(b) General Fighter/Attack Aircraft Capabilities. As directed by the JFC, the JFACC should assign fighters with optimum capabilities for surface TCT attack. Consideration should be given to the availability of the following:

• Day-night sensors, such as night vision devices (NVDs) and forward-looking infrared (FLIR) systems.

• Precision navigation and fire control systems, such as global positioning system (GPS), inertial navigation system (INS), fire control computer (FCC), high resolution map (HRM), and synthetic aperture radars (SAR)

• Precision guided munitions, such as LGBs and MAVERICK Missiles

(c) Airborne Divert. Fighter/attack aircraft en route to planned targets may be diverted to attack surface TCTs by battle management directors aboard AETACS (AWACS, ABCCC, E-2C, or DASC-A). Primary considerations for divert tasking is priority of the surface TCT versus that of the original planned target, distance from divert aircraft to the surface TCT, time en route from divert location, aircraft fuel state, weapons load, precision targeting capability, and en route threats. Airborne divert is a valid option for surface TCT attack provided conditions are such that rapid response can occur and the probability of mission success is high. However, airborne divert should only be exercised when no other option is available.

(d) Deconfliction from Other Operations. Once fighter/attack aircraft have been directed to attack a specific TCT, the JAOC (through AETACS) must ensure safe passage from surface TCT CAP location or divert points to the assigned target area. Using the grid box reference system, AETACS can quickly advise aircraft which areas are currently active with other attacks (aircraft, ATACMS, etc.) and which areas have established FSCMs and/or ACMs that would affect route of flight.

• Aircraft should use established MRRs, if appropriate, en route to the assigned target.

• There may be many cases where established MRRs do not exist between the aircraft's present location (surface TCT CAP or divert point) and the assigned target. In such cases, aircraft should determine, with the assistance of AETAC battle management directors, the safest route of flight to the target. Using the grid box reference system, aircrews can plot and fly a route with the characteristics of an informal, temporary MRR.

(e) Air Refueling Support. Fighter/attack aircraft assigned to surface TCT CAPs in support of surface TCT attack missions require dedicated airborne tanker support. Air refueling support extends the sortie duration of assigned fighters and increases their ability to remain on station for longer periods of time. Tanker tracks should be close enough to established CAP points to allow fighters to refuel quickly and resume CAP responsibilities. Also, such tanker tracks allow fighters to terminate air refueling operations on short notice and be relatively close to ingress points, allowing them to quickly initiate attack operations.

(f) Joint STARS Support. If designated by the JFC, Joint STARS platforms may direct fighter/attack aircraft missions against surface TCTs. However, targets designated by Joint STARS should be verified and positively identified by other cross-cued sensors, such as unmanned aerial vehicles (UAVs).

• Fighter/attack aircraft can be assigned directly to the Joint STARS platform for targeting information. The Joint STARS mission crew is informed, via the ATO or voice communications from the JAOC, of attack aircraft available, weapons loads, and on-station times. Weapons directors on-board the Joint STARS direct the attack aircraft against available targets. Weapons directors on-board the aircraft can predict and display the surface TCT's time of arrival at a specific geographic point or can predict the future position of a surface TCT at a specified time. This ability enables weapons directors to provide accurate surface TCT information to the attack aircraft. Additionally, if AWACS or CRC/CRE ground radar is tracking the attack aircraft, and transmits that track over JTIDS/TADIL-J, the weapons directors on-board the Joint STARS know the approximate position of the attack aircraft for easier coordination.

• The following list is an example of advisory and directive information the Joint STARS should provide to fighter attack aircraft:

•• Target coordinates/elevation in LAT/LONG (degrees/minutes/seconds), UTM, or geographic reference points. Elevation is estimated in feet (AGL and/or mean sea level [MSL])

•• Target description (quantity, formation, and classification)

•• Target direction (cardinal) and speed (nautical miles per hour [NMPH] or kilometers per hour [kph])

•• Choke point assessments

•• Location of friendlies

•• Location of threats

•• Time-over target coordination and deconfliction (grid box identification and establishment of FSCMs and/or ACMs)

•• Clearance to drop, if confirmed hostile through outside sources

(3) AC-130H/AC-130U Gunship Procedures. The AC-130H and AC-130U gunships are highly adaptable to a variety of special missions and offer the JFC unique capabilities in attacks against surface TCTs. Through the use of surgical firepower capabilities and precision night surveillance sensors, the AC-130, with its air refueling capability, can conduct extended autonomous operations within threat permissive environments.

(a) As directed by the JFC, the joint special operations task force (JSOTF) commander (in coordination with the JFACC) may assign AC-130 gunships to specific surface TCT attack responsibilities. The primary limiting factor to such an operation is the intensity of area threats.

(b) The AC-130 has the advantage of being able to loiter over known areas of surface TCTs with the ability to provide NRT response. AC-130 aircraft work best in planned engagement areas during anticipated engagement times.

(c) The airspace control authority should deconflict AC-130 orbits through the use of ACMs such as ROAs/ROZs and/or special use airspace. Normally, these orbits should be published in the ACO.

(d) Due to the slower speed of the AC-130 (as compared to fighter/attack aircraft), responsiveness may suffer if tasked to traverse considerable distance before engaging an acquired surface TCT.

(4) Attack Helicopter Procedures. Attack helicopters can launch rapidly to attack surface TCTs; however, slower en route times and range limitations must be considered when the decision to employ them is contemplated. To compensate, these assets should be placed on strip alert at either a laager site or at a more forward holding area in closer proximity to TCTs. Once alerted, the aircraft can be airborne in minutes.

(a) Most attack helicopters are capable of night operations with NVDs and FLIR in clear weather conditions. When low clouds and overcast conditions are present, helicopters may operate under lower ceilings than fighters or attack aircraft. Due to their slower speed, rotary-wing aircraft can often operate safely in poorer visibility than fixed-wing aircraft.

(b) Attack helicopter assets are controlled by the land or amphibious force commander. They may also be directly controlled by the JFC in support of specific joint force missions.

(c) Attack helicopter missions to and from surface TCTs should be deconflicted via MRRs. Coordination and deconfliction occur in the A2C2 element in the BCD, which in turn coordinates and deconflicts with the JAOC.

8. Command and Control Structuring

Command and control response to TCTs must be streamlined to meet time constraints. Though the overall responsibility for the mission will remain with the various supported commanders, the authority to engage should be delegated to the C2 node that has the best information or situational awareness to perform the mission and direct communications to weapons. Placing the appropriate level of battlespace awareness at subordinate C2 nodes can streamline the C2 cycle and allow timely engagement of these targets. The decentralized C2 nodes can exchange sensor, status, and target information with a fidelity that permits them to operate as a single, integrated C2 entity. Tied together by wide area networks and common interactive displays, they can effectively perform decentralized, coordinated execution of time critical attacks. The JFC has several options to structure C2 operations for attacks against surface TCTs. Normally, the JFC directs component commanders to establish interoperable and collocated (if possible) C2 centers. Additionally, the JFC must ensure the JSOTF commander effectively integrates SOF C2 operations with other components.

a. **Interoperable Air/Ground Operations**. The Theater Air-Ground System (TAGS) is the functional architecture through which interoperable air/ground operations occur. Joint air operations are normally directed from a JAOC. Depending on the appointed JFACC, the JAOC may either be an Air Force forces (AFFOR) air operations center (AOC), Marine forces aviation combat element (MARFOR ACE) TACC, or Navy forces (NAVFOR) TACC. Ground operations are normally directed through an operations center, such as the Army forces (ARFOR) tactical operations center (TOC) or MARFOR combat operations center (COC). Other key ARFOR agencies for ground operations are the FSE, Army Theater Missile Defense Element (ATMDE), DOCC, and FPTOC. Key MARFOR agencies include the ground control element (GCE) FFCC, FSCC, and FDC. The NAVFOR supports ground operations with the SACC. Interoperable air/ground operations ensure—

- Deconfliction of the battlespace.
- Coordination and synchronization of attack assets.
- Expeditious joint target coordination.
- Transmission of joint battlespace control and coordination measures.
- Conversion of target coordinates between LAT/LONG and UTMs.
- Exchange of component commander's target lists.
- Employment of common grid references (grid boxes).
- Enhancement of mutual air/ground situational awareness.

(1) Liaison Agencies. Between the JFACC and the land or amphibious component commander, liaison agencies exist to conduct coordination, deconfliction, synchronization, and integration of operations. At an established JAOC, the ARFOR operate a BCD. The MARFOR and NAVFOR are represented by liaison officers, as appropriate. At the ARFOR TOC, the AFFOR operate an ASOC. Similarly, the MARFOR operate a DASC to coordinate air operations with land operations, either with the MARFOR COC or ARFOR TOC, as appropriate.

(2) Unique Air/Ground C2 Capabilities. The ARFOR and AFFOR employ unique capabilities which enhance surface TCT attacks.

(a) Deep Operations Coordination Cell. The ARFOR may deploy a DOCC into the AO. The DOCC is a C2 node that plans, coordinates, and manages deep operations, to include surface TCT attacks, within the land force commander's AO. The DOCC develops deep attack plans based on identified HPTs. The DOCC selects attack assets based on several factors including the location of attack assets with respect to targets, the operational status of attack assets, target ranges, the number and type of missions in progress, munitions available, the enemy air defense threat, and the accuracy of the targeting acquisition data. This target-weapon pairing process is automatic. Targets that can be better serviced by joint or other component assets will be nominated to joint headquarters for prosecution (such as a JAOC). DOCCs may recommend direct sensor-to-shooter dissemination of targeting information to meet critical timelines associated with surface TCTs. The DOCC may employ an FPTOC to decentralize execution of surface TCT attacks. Future connectivity to the AFFOR/JFACC combat integration capability (CIC) will provide the means to coordinate and deconflict surface TCT attack operations.

(b) Combat Integration Capability. CIC is an AFFOR capability undergoing development. When fielded, the CIC will consolidate relevant sensor, intelligence, and air tasking information at the CRC and AOC (or JAOC, if the AFFOR is the JFACC). The CIC will provide battlespace awareness at the node at which the JFACC wishes to place execution authority for the attack of surface TCTs. The CIC is normally located at the AOC/JAOC COD. If placed at the CRC, it becomes an execution level extension of the COD. The CIC contributes to battlespace awareness through installation of a Combat Intelligence System (CIS) gateway that will provide enemy order of battle, active threat, surface TCT data, airspace deconfliction, and weather information. The CIC identifies attack assets for tasking against surface TCTs, much like AFATDS. Connectivity to the Army BCD, DOCC, and FPTOC provides the means to coordinate and deconflict surface TCT attacks. See *Air Combat Command Concept and Operations (ACC CONOPS) for C2 of the Attack Operations* and *Active Defense Phases of Theater Air Defense* and *Combat Air Forces (CAF) CONOPS for the CIC* for more information.

(3) Interconnectivity. Current technology limits electronic interconnectivity and automated data planning between the JAOC (whether it be the USAF AOC, USMC TACC, or USN TACC) and the BCD. Presently, only verbal coordination and deconfliction occurs. Similar limitations exist between the ARFOR TOC/MARFOR COC and ASOC/DASC. The level of interoperability is solely dependent on the ability of officers in both organizations to work with each other. However, component unique C2 system exist:

(a) CTAPS. CTAPS is the accepted joint standard air planning and C2 system which provides connectivity and overall situational awareness for the JFACC. It serves as a significant link between the JAOC and the ASOC/DASC. With CTAPS and other associated communications capability, the JAOC and ASOC/DASC have direct links with AETACS for rapid coordination and deconfliction of surface TCT attacks. See Appendix A for more information.

(b) AFATDS. AFATDS is the primary C2 fire support system for the ARFOR/MARFOR. AFATDS digitally links the land/amphibious force commander with their respective operations centers, FSE/FSCC, and firing units (to include ATACMS). AFATDS enables timely and automated C2 connectivity, sharing of situational awareness, and coordination and deconfliction of surface TCT attacks. See Appendix B and *TTP for AFATDS ST 6-3+* for more information.

(c) AFATDS - CTAPS Interface. Currently, AFATDS and CTAPS are undergoing modification to enable each system to share key elements of information. Initially, AFATDS and CTAPS will be able to share preplanned air information (such as the ATO and ACP) and real-time indirect fire trajectories (to include ATACMS PAH/TAH ROZs) for coordination and deconfliction of surface TCT attacks. This preplanned information will enhance component capabilities to develop preplanned FSCMs and ACMs. Eventually, AFATDS and CTAPS (and the follow-on Theater Battle Management Core System [TBMCS]) will be able to share real-time air information (such as the air situation picture) and enable rapid development and coordination of NRT FSCMS and ACMs. Such a system will rapidly and efficiently deconflict flight operations and indirect fires during surface TCT attacks.

(4) Information Requirements: Interoperable air/ground operations in the pursuit of surface TCT attacks require specific information passed between air and ground C2 agencies. The following is a notional list of key information requirements:

(a) From an air C2 agency:

- The ATO
- The ACO and ACP
- Actionable targets
- Airborne/ground threats
- Combined friendly/enemy air picture
- Fighter surface TCT CAP points
- Fighter taskings to surface TCT targets
- Surface TCT engagement areas
- Grid box activation intentions
- Target lists and nominations
- Enemy order of battle

(b) From a ground/surface C2 agency:

- Rotary-wing aviation routes (if applicable)
- Attack helicopter laager/staging areas
- SEAD plans
- Artillery locations and readiness status
- Actionable targets
- ATACMS locations and ready states
- ATACMS fires on surface TCT targets
- ACPs
- Airspace control requests
- Engagement areas
- NFAs, FSCL, phase lines, and other control measures
- Maneuver unit locations
- Surface TCT engagement areas
- Target lists and nominations
- Friendly force locations

b. **Coordinating SOF Operations**. SOF operations must be coordinated and deconflicted with surface TCT attacks. The primary method to accomplish this is via liaison with established conventional C2 agencies. The special operations liaison element (SOLE) is linked with the JAOC for interface with regard to air operations. The special operations coordinator (SOCOORD) or special operations C2 element (SOCCE), if established, is linked with surface C2 agencies (DOCC/FSE/FSCC/SACC) for ground operations. The SOLE, SOCOORD, and SOCCE have situation awareness on the SOF locations and activities in and outside of the AO/AOA. Most SOF operations areas can be protected by RFAs, NFAs, or in some instances, ROAs/ROZs. Clandestine SOF operations, where published control and coordinating measures may not be permitted, will require direct coordination and deconfliction with friendly forces by the SOLE, SOCOORD, or SOCCE. If conventional force operations put SOF operations at risk (for example, an ATACMS attack), the SOLE, SOCOORD, or SOCCE is responsible for deconfliction and/or recommending disapproval due to the potential for fratricide.

9. Battle Management System Interconnectivity

Battle management systems should allow the JFC and component commanders to pass targeting information on surface TCTs on an NRT basis. Effective targeting of TCTs requires common targeting terminology and notation as well as lateral and vertical connectivity between all component C2 agencies. Secure, jam resistant, automated data systems are critical for the NRT exchange of surface TCT information. Current service unique data link standards and targeting notations inhibit true joint interoperability. Presently, the JFC's options are limited. The JFC can locate common data terminals at each component's C2 agencies (as available) or attempt to establish a network of dissimilar system data terminals. Battle management systems should allow the JFC and component commanders to pass targeting information on surface TCTs on an NRT basis. Currently, however, these systems are limited to internal component operations only. Effective targeting of surface TCTs requires lateral and vertical connectivity between all component C2 agencies. Secure, jam resistant, automated data systems are critical to support this connectivity. Presently, the only options a JFC has to connect component battle management systems is to provide common terminals at each component C2 agency or connect dissimilar component terminals together.

a. **Common Terminal Connectivity**.

Locating common data terminals at each component C2 agency allows immediate and simplified direct connectivity. The JFC should decide which terminal should be fielded based upon capabilities in the operational area.

(1) Locations. Common terminals may be located at the following component C2 agencies:

(a) JAOC/TACC/ASOC/DASC/SACC

(b) AETACS platforms (AWACS/ ABCCC/DASC-A/E-2C)

(c) CRC/CRE/AEGIS/tactical air operations center (TAOC)

(d) BCD/FSE/FSCC/DOCC/FPTOC

(2) Terminals. Common terminals that may be assigned to each location are situationally dependent on availability in the operational area and mission requirements. However, the JFC should consider—

(a) CTAPS.

(b) Joint Tactical Information Data System (JTIDS.)

(c) GSMs.

(d) ADOCS.

(e) AFATDS.

b. **Dissimilar Terminal Connectivity**. Connecting dissimilar battle management systems generally requires the development of data translation programs to bridge one system's language with another. Expected results would be the ability of dissimilar systems to "talk" to one another and thereby rapidly share information. Battle management systems fall into two general categories: air tactical digital information systems and ground digital information systems. JTIDS and CTAPS are air tactical information systems that have been designated as joint systems for use by all services. However, JTIDS and CTAPS have limited use applications for the land or amphibious force commander and associated maneuver forces. Instead, they predominantly use ground digital tactical information systems supported by fire support data systems such as the AFATDS or the experimental ADOCS. Connecting JTIDS and CTAPS workstations to AFATDS/ADOCS terminals is a viable technique provided data buffers can adequately transfer information. Once the connection is made, acquired surface TCTs can be communicated real time between components via JTIDS/CTAPS and AFATDS/ ADOCS. Dissimilar terminals require either common target numbers, common target identification information, or correlated target numbers.

c. **Common Target Numbers**. Common target numbers allow each component to precisely identify targets and communicate with other components via a common frame of reference. However, common target numbers only exist for two categories of targets:

- Fixed installations (as basic encyclopedia numbers [BE#s])

- Enemy order of battle (as individual unit identification codes [UICs])

BE#s and UICs are unfeasible for surface TCTs. Components normally assign their own arbitrary, unique target numbers to surface TCTs. However, this leads to several problems. First, these target numbers differ from other target numbers assigned *to the same target* by other components. Second, components use these unique target numbers solely within their individual component battle management systems—that are presently *incompatible* with other component systems. Thus, confusion and duplication often occurs. True universal common target numbers, beyond BE#s and UICs, have not been established.

(1) Basic Encyclopedia Number. A BE# is a 10 character number unique to each fixed installation (example: BE# 0000XX0000). The first 4 characters identify the world area code (WAC) where the installation is located. The next 6 spaces uniquely label the identifying source of the installation with the fifth and sixth spaces serving as identifying agency codes. For example, if United States Central Command (USCENTCOM) adds an installation to the military intelligence database, it uses the two alpha characters assigned to it for this purpose.

(2) Unit Identification Code. UICs are 10 character codes that are used to track enemy order of battle (example: UIC-XXXXX00000). The first 2 characters identify the responsible producer. The third and fourth spaces identify the country code for the unit. The fifth character is used to identify the type of unit (that is, air, ground, naval). The remaining 5 characters are sequentially assigned.

- Field initiated *soft UICs* have been used to track unidentifiable enemy units. Soft UICs include a character that identifies the component which first located the enemy unit.

(3) Temporary CTN Solutions. Some geographic combatant commanders (Unified CINCs) have had success in establishing temporary CTN solutions in simple joint operations with limited target sets. Such CTNs were simple, alphanumeric characters, tracked manually:

EXAMPLE: JM 003
J = joint target
M = mobile target
003 = sequential number

(4) Long Term CTN Solutions. Long term CTN solutions must be able to withstand a more dynamic and complex operation with large target sets, supported by data processing and multiple reconnaissance and surveillance inputs. One such CTN format being experimented with is the integrated database (IDB) unit identification numbering method. This method works well in identifying mobile targets. Since major units assigned to garrison locations receive a unique 7-10 digit IDB identifier, mobile subordinate elements of these units could be assigned the parent unit identifier coupled with an alphanumeric character representing function and element:

EXAMPLE #1: ICACU03892-L1
IC = responsible producer
A = air
CU = country code
03892 = number assigned in IDB tied to garrison BE#
L = launcher
1 = first detached

EXAMPLE #2 : ICACU03892-003A
IC = responsible producer
A = air
CU = country code
03892 = number assigned in IDB tied to garrison BE#
003 = IDB code for the mobile rocket battalion with equipment code
A= alpha character to delineate individual launchers

d. **Correlated Target Numbers**. Correlated target numbers offer a partial solution to the CTN problem. Methods to correlate individual component target numbers are relatively simple. Essentially, one component's target number is "tagged" with another component's number and input into each battle management system. The correlated pair of numbers is transmitted across data nets to all component users of each system. Once received, the user can identify the target by recognizing the component target number that operates within the operating data system and then reference the other component's number as necessary via accompanying data or remarks. This allows for common situational awareness and provides the avenue for coordination and deconfliction. Responsibility for correlating target numbers does not have to be assigned to a centralized agency. Each component can accomplish this function independently without redundant or duplicated numbers. Each component can be allocated blocks of other component numbers to tag with their primary component target number. Once the tagged numbers are transmitted across data links, other components can easily recognize the source of the target by its correlated number.

NOTES

[1] Jt Pub 1-02, DOD Dictionary of Military and Associated Terms, March 23, 1994, p 366

[2] Jt Pub 3-0, Doctrine for Joint Operations, February 1, 1995, p III-33

[3] Ibid

[4] Ibid

[5] Ibid

[6] Ibid

[7] Ibid

[8] FM 101-5-1, *Army Operational Terms and Symbols*, October 21, 1985, p I-19

[9] Jt Pub 3-0, *Doctrine for Joint Operations*, February 1, 1995, p III-34

[10] Jt Pub 3-52, *Doctrine for Joint Airspace Control in the Combat Zone*, December 3, 1993, p B-3

[11] Ibid, p v

[12] Ibid, p B-7

[13] Ibid, p B-5

[14] Ibid, p B-6

[15] Ibid

[16] Ibid

[17] Jt Pub 3-0, *Doctrine for Joint Operations*, February 1, 1995, p III-34

[18] Ibid

[19] Ibid

[20] Ibid, p III-35

[21] Ibid, p III-34

[22] Ibid

[23] Jt Pub 3-09.3, J*oint Tactics, Techniques, and Procedures for Close Air Support, p IV-11*

[24] Ibid

[25] Ibid

[26] Ibid, p IV-12

[27] Ibid, p IV-13

[28] Ibid

[29] ST 6-60-36, *Army Tactical Missile System (ATACMS) Tactics, Techniques, and Procedures* , March 17, 1995, p 17

[30] Ibid

Appendix A

CONTINGENCY THEATER AUTOMATED PLANNING SYSTEM (CTAPS)

1. CTAPS is a joint force level computerized command and control backbone system currently implemented by the USAF, USN, and USMC. It consists of common, modular, deployable communications-computer equipment and software applications. The software applications described below run on the CTAPS standard workstation (Sun Sparc). CTAPS is designed to interface the joint air operations center (JAOC), air support operations centers (ASOC), and control and reporting centers (CRC), and connect functional areas within these centers using a local area network (LAN).

2. CTAPS provides automated data exchange; processing and display capabilities for friendly and enemy combat information; support to ATO planning, generation and dissemination; mission execution monitoring; and, mission reporting/assessment. System implementation will be incremental, with various functions and capabilities being added to the core system in modular fashion.

3. Inputs to CTAPS include messages and CINC/JFACC tasking and directives, information provided by the various force level functional areas, and user support requests from other command centers. Outputs include the combat information and data provided by linked functional centers/areas and their associated support systems; the ATO/ACO; and various direction and coordination action messages/reports. Planned enhancements include a battlefield situation display capability for situation awareness, full interconnectivity between command centers and functional areas, and additional automated functions.

Table A-1. CTAPS Applications and Capabilities

ADS: Airspace Deconfliction System	• Plans requested airspace. • Identifies airspace by time, altitude, and position. • Builds an airspace control order (ACO).
TISD: Theater Integrated Situation Display	• Provides a NRT radar-sourced air picture for the AOC planning and execution functions. • Air picture capability will eventually be incorporated into the battlefield situation display (BSD).
CIS: Combat Intelligence System	• Supports data correlation/fusion, situation assessment/ display, order of battle (OB) database maintenance, imagery, and collection management. • Identifies and assesses targets from intelligence database. • Analyzes effects of various targeting combinations. • Accesses JMEM to perform weaponeering, and create a target nomination list for inputs to APS for ATO planning.
APS: Advanced Planning System	• Provides an automated capability to develop air battle plans and create combat and support mission taskings. • Provides graphic displays of the developing ATO. • Loads the CTAPS master database, enabling execution applications access to the completed ATO.
JPT: Joint Planning Tool and **ACPT:** Air Campaign Planning Tool	• Enables rapid development, visualization, and evaluation of air campaign options; provides results and assessments. • Provides access to maps, imagery, country studies, target analyses, and OB information. • Graphically displays information allowing JFACC to visualize large amounts of data and analyze updates. • Primary outputs are overall air campaign plan and daily master attack plan.
JDSS: Joint Decision Support System	• Provides graphically oriented presentation of C4I data in user-selectable and combinable on-screen displays. • Has access to local C4I database directories and generates query scripts for other databases.
FLEX: Force-Level Execution (Combat Operations Automation)	• Central module serving AOC's combat operations staff. • Provides capability to respond to the tactical situation by replanning the ATO and disseminating changes. • Provides tailorable mission and status alarm capabilities to monitor progress of ongoing air campaign activities.
BSD: Battlefield Situation Display	• Displays tailorable view of air and ground (land) situations. • Provides common identification of targets and other objects and *access through the view* to underlying data.

Appendix B

ADVANCED FIELD ARTILLERY TACTICAL DATA SYSTEM (AFATDS)

1. AFATDS is a multiservice (Army and Marine Corps) fire support software system that runs on the Army's common hardware for the Army battle command system (ABCS). AFATDS provides the land or amphibious force commander with a robust ability to conduct automatic digital coordination on all land/amphibious fire support requests including ATACMS missions, CAS missions, attack helicopter operations, naval gunfire missions, and mortar/cannon/rocket missions. This coordination allows the commander to automatically prioritize and engage targets in the fastest time possible with positive coordination across the battlespace and have flexibility in using available resources. It also can deconflict fires from other airspace operations. AFATDS prioritizes multiple missions to ensure the most important missions are processed first. It also checks incoming fire missions against FSCMs, ACMs, and unit boundaries/zones of responsibility. AFATDS notifies the operator and automatically, electronically requests clearance from the unit that established the control measure. That unit must approve or deny the mission before processing continues.

2. AFATDS is equipped with a situational awareness screen. The screen is able to display range fans, FSCMs, ACMs, target overlays, battlefield geometry, and common reference systems. The graphics can be tailored using up to seven separate overlays. By clicking on a target, a commander can review all mission and target information and digitally track the status of each mission.

a. **Version 1** of AFATDS allows for automated digital coordination and replaces the initial fire support automation system (IFSAS) and tactical fire direction system (TACFIRE). Version 1 digitally automates the following:

(1) All on-line army battle command systems

(2) Shared fire support situation awareness distributed databases

(3) Fire planning

(4) Weapon target pairing in accordance with command guidance

(5) Execution of fires on surface targets

b. **Version 2** *(in development)* will feature a tactical air support module (TASM) to assist in the joint targeting process and provide joint interoperability. Eventually, AFATDS will provide an automated, comprehensive tactical fire support decision support system. AFATDS TASM will ease daily coordination and planning by providing automated access to the JFACC's ATO. The operator will be able to use ATO information to keep missions from conflicting, including those involving ATACMS. AFATDS will also be able to provide future input to ATOs, as well as incorporate ATO sortie information to prevent target conflicts. TASM processes target nominations from the DOCC/FSE/FSCC to the BCD for coordination with the JAOC. TASM can also process target nominations and send them directly into CTAPS for rapid coordination. TASM has the capability to enable AFATDS to pass digital requests for CAS and AI support directly to the BCD and JAOC via CTAPS. This does away with the requirement to pass requests for air support via voice.

3. AFATDS can rapidly coordinate attacks on surface TCTs. Intelligence data on the surface TCT is passed via ASAS to AFATDS at the DOCC/FSE/FSCC or directly to AFATDS from Joint STARS. AFATDS automatically verifies the surface TCT with the high payoff target list and conducts weapon-target pairing. AFATDS displays to the DOCC/FSE/FSCC operators if the target violates any fire support coordination measures or airspace control measures.

(***Note: Such established measures, once identified and deconflicted by the grid box reference system, may be inserted into AFATDS.***) If the target violates established FSCMs and ACMs, then the operator receives an amber warning light on his intervention window, meaning that coordination must take place. The operator would OK the mission request, sending an automatic message to the BCD for coordination. The BCD coordinates with the JAOC, and then the BCD approves or denies the request. Similar coordination and deconfliction can occur between the FPTOC and the COD (equipped with CIC), or other component fire support centers (such as the USMC FFCC). Once deconflicted and approved, the mission is sent digitally to the firing unit for processing. Firing units who acquire the identical target and send identical requests will be sorted by the system and disapproved automatically via a red light in the intervention window.

Appendix C

AUTOMATED DEEP OPERATIONS COORDINATION SYSTEM (ADOCS)

ADOCS is a LAN system developed by the Advanced Research Projects Agency (ARPA) and in field testing/use by the US Army. The functions of ADOCS are—

a. Coordination, planning, and execution databases (to include targeting, aviation routes, air control points, ACPs, and deep battle synchronization).

b. Interface with US Army systems such as TACFIRE, Fire Direction System (FDS), Fire Direction Data Management (FDDM), ASAS-W, MCS, and the Target Acquisition Fire Support Model.

c. Display of situational graphics such as order of battle and threats, friendly maneuver and artillery units, phase lines, engagement areas, RFAs, and TAIs.

d. Display of mission coordination and execution status.

e. Interface with AFATDs.

f. Conduct targeting operations.

g. Exercise control and alerting procedures.

h. Coordinate aviation planning and airspace control measures.

i. Collect data on selected targets.

j. Provide mission reports, to include ATACMS missions fired and target lists.

References

Joint

Joint Publication 1, *Joint Warfare of the Armed Forces of the United States*, 10 Jan 95

Joint Publication 0-2, *Unified Action Armed Forces (UNAAF)*, 24 Feb 95

Joint Publication 1-02, *DOD Dictionary of Military and Associated Terms*, 24 Mar 95

Joint Publication 2-0, *Joint Doctrine for Intelligence Support to Operations*, 5 May 95

Joint Publication 2-01, *Joint Intelligence Support to Military Operations,* 20 Nov 96

Joint Publication 2-01.1, *Joint Tactics, Techniques and Procedures for Intelligence Support to Targeting* (in development)

Joint Publication 3-0, *Doctrine for Joint Operations,* 1 Feb 95

Joint Publication 3-01, *Joint Doctrine for Countering Air and Missile Threats*

Joint Publication 3-01.5, *Doctrine for Joint Theater Missile Defense,* 30 Mar 94

Joint Publication 3-03, *Doctrine for Joint Interdiction Operations* (in development)

Joint Publication 3-05.5, *Joint Special Operations Targeting and Mission Planning Procedures,* `10 Aug 93

Joint Publication 3-09, *Doctrine for Joint Fire Support* (in development)

Joint Publication 3-09.3, *Joint Tactics, Techniques, and Procedures for Close Air Support, 1 Dec 95*

Joint Publication 3-52, *Doctrine for Joint Airspace Control in the Combat Zone,* 3 Dec 93

Joint Publication 3-55, *Doctrine for Reconnaissance, Surveillance, and Target Acquisition Support for Joint Operations (RSTA),* 14 Apr 93

Joint Publication 3-56, *Command and Control Doctrine for Joint Operations* (in development)

Joint Publication 3-56.1, *Command and Control for Joint Air Operations*, 14 Nov 94

Joint Publication 5-0, *Doctrine for Planning Joint Operations*, 13 Apr 95

Joint Publication, 5-00.2, *Joint Task Force Planning Guidance and Procedures*, 1 Sep 91

Joint Publication 6-0, *Doctrine for Command , Control, Communications, and Computer (C4) System Support to Joint Operations*, 3 Jun 92

Unified Command

USACOM Joint Targeting Concept of Operations, 7 Sep 93

ROK-USCFC Air Ground Operations Standing Operating Procedures, (AGOSOP), Jun 95

ROK-USCFC Concept of Operations for Air Support in the Korean Theater, 15 Dec 93

ROK-USCFC Concept of Operations for ACC Support to the Rear Area, 23 Jun 94

ROK-USCFC Deep Operations Primer

ROK-USCFC Handbook for Command and Control of Air Support in the Korean Theater, 15 Feb 94

Multiservice

FM 100-103-1/FMFRP 5-61/NDC TACNOTE 3-52.1/ACCP 50-38/PACAFP 50-38/USAFEP 50-38, *Multiservice Procedures for Integrated Combat Airspace Command and Control (ICAC2)*, 3 Oct 94

FM 100-103-2/FMFRP 5-62/NDC TACNOTE 3-56.2/ACCP 50-54/PACAFP 50-54/USAFEP 50-54, *Multiservice Procedures for the Theater Air Ground System (TAGS)*, 31 Oct 94

Multiservice Tactics, Techniques, and Procedures for the Joint Surveillance Target Attack Radar System (Joint STARS), classification of publication is SECRET, Aug 97

FM 6-20-10/MCRP 3-16.14, *Tactics, Techniques, and Procedures for the Targeting Process*, 8 May 96

FM 6-60/FMFRP 6-6-60, *Tactics, Techniques, and Procedures for Multiple Launch Rocket System (MLRS) Operations*

Army

FM 100-12, *Army Theater Missile Defense Operations* (in development)

FM 100-13, *Battlefield Coordination Detachment (BCD)* (in development)

FM 100-103, *Army Airspace Command and Control in a Combat Zone*, 1 Oct 87

FM 101-5-1, *Army Operational Terms and Symbols*, 21 Oct 85

ST 6-3+, *Advanced Field Artillery Tactical Data System (AFTADS) Tactics, Techniques, and Procedures*

ST 6-60-36, *Army Tactical Missile System (ATACMS) Tactics, Techniques, and Procedures*, 17 Mar 95

1st Battlefield Coordination Detachment (BCD) Tactical SOP, 1 May 93

XVIII Airborne Corps Joint Targeting Procedures, 1 May 92

USAEUR Battlefield Coordination Element (BCE), Standing Operation Procedures, 11 Oct 94

Marine

FMFM 6-18, *Techniques and Procedures for Fire Support Coordination*, 27 Mar 92

Air Force

Air Combat Command Concept of Operations for Command and Control of the Attack Operations and Active Defense Phases of Theater Air Defense (Draft Mar 96)

Combat Air Forces Concept of Operations for the Combat Integration Capability (CIC), Feb 95

AFPAM 200-17, *An Introduction to Air Force Targeting*, 23 Jun 89

Other

CSAF/CSA Article, *The Army-Air Force Team: Leveraging Our Strengths*, 22 Feb 96

Glossary

ACRONYMS

A2C2	army airspace command and control
ABCCC	airborne battlefield command and control center
ABCS	army battle command system
ACA	airspace control area; airspace control authority; airspace coordination area
ACC	Air Combat Command
ACE	aviation combat element (MAGTF)
ACM	airspace control measures
ACO	airspace control order
ACP	airspace control plan
ACPT	air campaign planning tool
ADM	air defense measure
ADOCS	Automated Deep Operations Coordination System
ADP	automated data processing
ADS	Airspace Deconfliction System
AETACS	Airborne Elements of the Theater Air Control System
AFATDS	Advanced Field Artillery Tactical Data System
AFFOR	Air Force forces
AFI	Air Force Instruction
AFJPAM	Air Force Joint Pamphlet
AGL	above ground level
AGM	attack guidance matrix
AI	air interdiction
ALSA	Air Land Sea Application
ANGLICO	air/naval gunfire liaison company
AO	area of operations
AOA	amphibious objective area
AOC	air operations center
AOR	area of responsibility
APS	Advanced Planning System
ARFOR	Army forces
ARNG	Army National Guard
ARPA	Advanced Projects Research Agency
ASAS	All Source Analysis System
ASAS-W	All Source Analysis System-Warrior
ASOC	air support operations center
atk	attack
ATACMS	Army Tactical Missile System
ATDO-A	Joint and Army Doctrine Division, TRADOC
ATMDE	Army Theater Missile Defense Element
ATO	air tasking order
attn	attention
AWACS	Airborne Warning And Control System
B.C.	before Christ
BCD	battlefield coordination detachment
BDA	battle damage assessment

BE	basic encyclopedia
bn	battalion
BSD	Battlefield Situation Display
C2	command and control
C2W	command and control warfare
C3	command, control, and communications
C4I	command, control, communications, computers, and intelligence
C42	Joint Doctrine Division, MCCDC
CA	combat assessment
CAF	Combat Air Forces
CALCM	conventional air launched cruise missile
CAP	combat air patrol
CAS	close air support
CCT	combat control teams
CFC	Combined Forces Command (Korea)
CFL	coordinated fire line
CIC	combat integration capability
CINC	commander in chief; combatant commander
CIS	Combat Intelligence System
CJCS	Chairman, Joint Chiefs of Staff
COA	course of action
COC	combat operations center
COD	combat operations division
COG	center of gravity
comm	commercial
COMSEC	communications security
CONOPS	concept of operations
CRC	control and reporting center
CRE	control and reporting element
CTAPS	Contingency Theater Automated Planning System
CTN	common target number
D3A	decide-detect-deliver-assess
DA	Department of the Army
DASC	direct air support center
DASC-A	direct air support center-airborne
DOCC	deep operations coordination cell
DOD	Department of Defense
DSN	Defense Switched Network
DST	decision support template
DZ	drop zone
E-mail	electronic mail
EC	electronic combat
e.g.	for example
EOB	enemy order of battle
EW	electronic warfare
FA	field artillery

FAC	forward air controller
FAC-A	forward air controller (airborne)
FCC	fire control computer
FDC	fire direction control
FDDM	fire direction data manager
FDS	fire direction system
FFA	free fire areas
FFCC	force fires coordination center
FLEX	force-level execution
FLIR	forward looking infrared
FLOT	forward line of own troops
FM	field manual
FMFM	Fleet Marine Force Manual
FMFRP	Fleet Marine Force Reference Publication
FPTOC	force projection tactical operations center
FSC	fire support coordinator (USMC)
FSCC	fire support coordination center
FSCL	fire support coordination line
FSCM	fire support coordination measure
FSCOORD	fire support coordinator (US Army)
FSE	fire support element
ft	foot; feet
GAT	guidance, apportionment, and targeting
GCE	ground control element
GPS	global positioning system
GSM	ground station module
HIDACZ	high-density airspace control zone
HPT	high-payoff target
HPTL	high-payoff target list
HRM	high resolution map
HVT	high-value target
HVTL	high-value target list
ICAC2	Integrated Combat Airspace Command and Control
IDB	integrated data base
IFSAS	initial fire support automated system
IM	information management
IMINT	imagery intelligence
INFLTREPS	in-flight reports
INS	inertial navigation system
I**NTSUM**	intelligence summary
IPB	intelligence preparation of the battlespace
ITO	integrated tasking order
J-2	Intelligence Directorate of a joint staff
J-3	Operations Directorate of a joint staff
J-4	Logistics Directorate of a joint staff
J-5	Strategic Plans and Policy Directorate of a joint staff

J-6	Command, Control, Communications, and Computer
JAG	judge advocate general
JAOC	joint air operations center
JDSS	Joint Decision Support System
JFACC	joint force air component commander
JFC	joint force commander
JFMCC	joint force maritime component commander
JIC	joint intelligence center
JIPTL	joint integrated prioritized target list
JISE	joint intelligence support element
JMEM	joint munitions effectiveness manual
JOA	joint operations area
JOG	joint operation graphic
Joint STARS	Joint Surveillance Target Attack Radar System
JPOTF	joint political operations task force
JPT	JFACC planning tool
JSOTF	joint special operations task force
jt	joint
JTCB	joint targeting coordination board
JTF	joint task force
JTIDS	Joint Tactical Information Distribution System
JTL	joint target list
JTTP	joint tactics, techniques, and procedures
i.e.	that is
km	kilometer
kph	kilometers per hour
LAN	local area network
LANTIRN	low altitude navigation and targeting for night
LAT	latitude
LCC	land component commander
LGB	laser guided bomb
LOAC	law of armed conflict
LONG	longitude
m	meter
MA	mission assessment
MAGTF	Marine air ground task force
MARFOR	Marine forces
MARLO	Marine liaison officer
MASINT	measurement and signature intelligence
max	maximum
MCCDC	Marine Corps Combat Development Command
MCPDS	Marine Corps Publication Distribution System
MCRP	Marine Corps Reference Publication
MCS	maneuver control system
MEA	munitions effective assessment
METT-T	mission, enemy, terrain and weather, troops and support available, and time available

MIIDS/IDB	military intelligence integrated database/integrated database
MILSTRIP	Military Standard Requisitioning and Issue Procedure
min	minute
MISREPS	mission reports
MLP	missile launch point
MLRS	Multiple Launch Rocket System
MRL	mobile rocket launcher
MRR	minimum-risk route
MSL	mean sea level
MTIC	Military Targeting Intelligence Committee
MTTP	multiservice tactics, techniques, and procedures
NAI	named areas of intent
NAVFOR	Navy forces
NAVSOP	Navy Standing Operatin Procedures
NCA	National Command Authorities
NDC	Naval Doctrine Command
NFA	no-fire area
NGFS	naval gunfire support
NM	nautical mile
NMJIC	National Military Joint Intelligence Center
NMPH	nautical miles per hour
NRT	near-real-time
NSFS	naval surface fire support
NVD	night vision device
NWP	Naval Warfare Publication
OB	order of battle
OPLAN	operation plan
OPORD	operation order
OPR	office of primary responsibility
PAH	platoon airspace hazard area
PCN	publication control number
PGM	precision guided munitions
PIN	publication inventory number
PLGR	precision location ground reference
POLAD	political advisor
pub	publication
PSYOP	psychological operations
qty	quantity
RFA	restricted fire areas
RFL	restricted fire line
ROA	restricted operations area
ROE	rules of engagement
ROK	Republic of Korea
ROZ	restricted operations zone

RR	reattack recommendation
RSTA	reconnaissance, surveillance, and target acquisition
SACC	supporting arms coordination center
SADO	Senior Air Defence Officer
SAM	surface-to-air missile
SAR	synthetic aperture radar
SCDL	surveillance control data link
SEAD	suppression of enemy air defenses
SIGINT	signals intelligence
SIOP	Single Integrated Operations Plan
SIPTL	Single Integrated Prioritized Target List
SOCCE	special operations command and control element
SOCOORD	special operations coordinator
SOF	special operations forces
SOJ	standoff jamming
SOLE	special operations liaison element
SPIN	special instruction
SSM	surface-to-surface missile
TACC	tactical air command center (USMC); TACC tactical air control center (USN)
TACFIRE	tactical fire direction system
TACMEMO	tactical memorandum
TACP	tactical air control party
TADIL-J	tactical data link-joint
TAGS	theater air-ground system
TAH	target airspace hazard area
TAI	target area of interest
TAOC	tactical air operations center
TASM	tactical air support module
TBM	theater ballistic missile
TBMCS	theater battle management core system
TCT	time-critical target
TGTINFOREP	target information report
TIRS	terrain index reference system
TISD	Theater Integrated Situation Display
TLAM	Tomahawk Land Attack Missile
TLE	target location error
TMD	theater missile defense
TOC	tactical operations center
TOO	target of opportunity
TOT	time-on-target
TP	test publication
TRADOC	United States Army Training and Doctrine Command
TRP	terrain reference point
TSS	target selection standards
TTP	tactics, techniques, and procedures
TTT	time-to-target

UAV	unmanned aerial vehicle
UHF	ultra high frequency
UIC	unit identification code
US	United States
USA	United States Army
USAF	United States Air Force
USAR	United States Army Reserve
USCENTCOM	United States Central Command
USMC	United States Marine Corps
USN	United States Navy
UTM	universal transverse mercator
VA	Virginia
VHF	very high frequency
WAC	world area code
WGS	world geodetic survey
WMD	weapons of mass destruction
WOC	wing operations center
XPJ	Joint Matters and Arms Control Division, ACC
#	number

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